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From the Editor's Desk

The range of orchids available to us now, in species and hybrids, is at an all time high. Orchid flasks are being shipped around the globe, and thankfully we still have a few nurseries and hobbyists going through the protracted red-tape process of importing and having their plants quarantined. If they survive all this and grow, then we have had the desired outcome! That's also why imported orchids are still expensive in Australia.

There are still many desirable orchid species (and hybrids) that I have seen on my visits overseas, that don't appear to be in general cultivation here. If they are, then they are certainly not readily available.

In this issue I showcase some very desirable orchids that I am sure would become popular additions to the mixed collection if plants were accessible. Here I have just touched on a few examples from the Californian (USA) nurseries of Andy's Orchids and Sunset Valley Orchids.

Sam Cowie is back with his popular "Road Tests", whilst also discussing "pot in pot" cultivation techniques. Sam is a successful professional wholesale orchid grower and we appreciate his contributions and wisdom.

Ray Clement also discusses a couple of special plants that he grows and has just released through his nursery, Tinonee Orchid Nursery. *Epicattleya* Gerardus Staal and *Sedirea japonica*. Readers can pick up both near-flowering sized plants of these novelties for only $25.00 (plus postage).

We also have a number of Book Reviews of some of the newer relevant texts recently released. Remember we also have a great selection of popular titles in the ***AOR Mail Order Bookshop***.

The Australian Orchid Foundation have been sponsoring an essay competition over the past few years, with the most recent topic being "How do you manage your Orchid Collection without relying on artificial heating and/or cooling?" The top three entries are reproduced here, submitted by Brian Dear, Richard Mollee and Julie Copely-Bishop.

David Jones and Robert Bates continue to describe new native orchid species from Southern Australia. Whilst Alan Stephenson discusses a number of *Cryptostylis* species.

Remember you can subscribe, renew or extend your subscriptions to the *Australian Orchid Review* on our secure website at www.australianorchidreview.com.au You can also visit our page on Facebook. ■

David Banks
Australian Orchid Review
david@hillsdistrictorchids.com

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Cover Shot

Ascocentrum christensonianum
is a charming miniature Vandaceous species from Vietnam, that was described in 1993.
(Plant: Andy's Orchids, USA – Photo: David Banks)

Sobralia macrantha

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Orchids You Don't See Every Day

Text and photos by David Banks

I've been growing orchids for over four decades, and I still get excited when I see outstanding new species or orchid hybrids for the first time. We probably have close to 40,000 documented orchid species around the world plus over 200,000 man-made hybrids, so there is something for everyone.

I was recently cataloguing my digital orchid photo library (of close to 100,000 images!) and came across an interesting block of photos from my California USA trip from back in July 2012. I was there primarily for the Orchid Digests "Speakers Day", but also got to visit a number of private collections and iconic nurseries including Andy's Orchids, Cal Orchid, Paphanatics, Santa Barbara Orchid Estate and Sunset Valley Orchids.

I selected a few of the more eclectic orchids that I got to see on this whirlwind visit, and will focus on just a couple of nurseries for now.

ANDY'S ORCHIDS

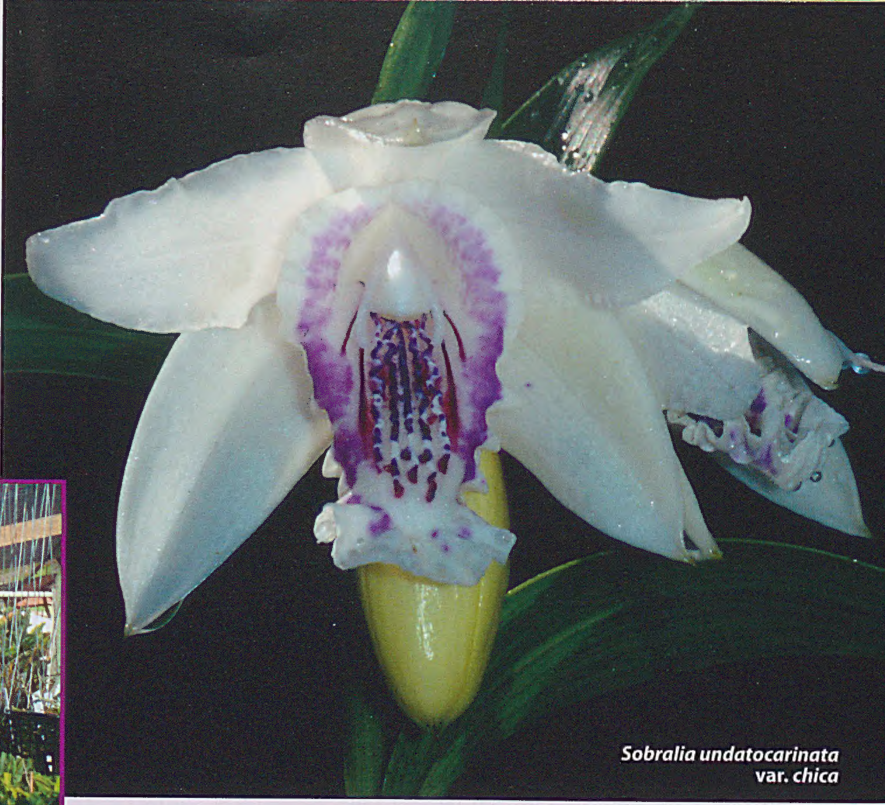
Where do you start? This is put simply the best and most comprehensive orchid species collection I have ever seen. Close to 200,000 plants, covering over 3000 different taxa. Andy Phillips started his nursery, north of San Diego back in 1990, and it's just a treasure trove of interesting goodies. I have been fortunate enough to have visited on a few memorable occasions now, and the time literally always flies in Andy's company. So many plants and flowers… so little time. Haven't we heard that before! In the days of slide film, I burnt up so many boxes of Kodachrome 64 (younger people will have to Google that!), and even in this digital age it is still difficult to keep up. I will be back.

Being summertime in the northern hemisphere, there were numerous terrestrial *Sobralia* species blooming in the shadehouses, and also in the garden. There were numerous specimen plants of the highly variable ***Sobralia macrantha*** scattered around the gardens. The individual blooms generally only last a day or few, yet these plants had put on a wonderful display of their *Cattleya*-like flowers. One of Andy's shadehouses was built specifically for this genus that has some very tall growing members. Inside was one of the finest (and largest flowered) forms of ***Sobralia macrantha*** I've witnessed, with a huge labellum. I've also never seen a taller shadehouse, must be over six metres tall. One of the taller ones being ***Sobralia dichotoma*** or a species closely related to it. The flowers were in bunches just under the roof.

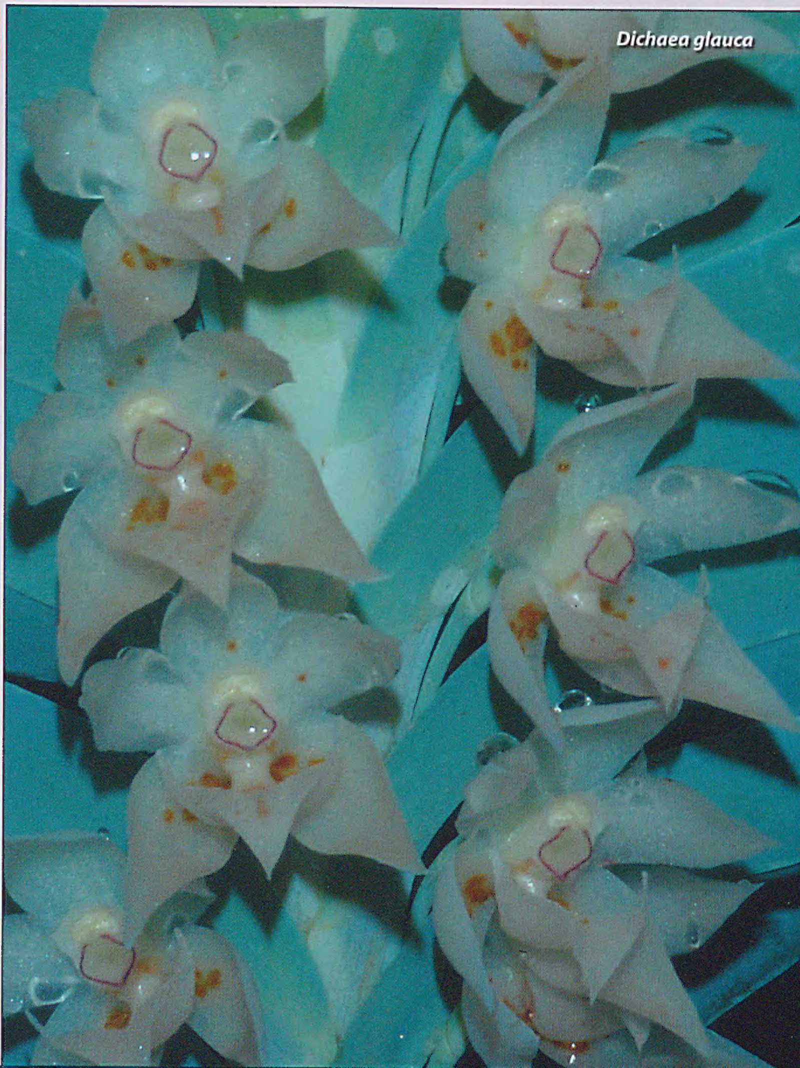
Sobralia macrantha

Sobralia dichotoma

The *Sobralia* species that impressed me the most had a flower that reminded me of the unrelated *Coelogyne mooreana* but with a bluish labellum. It's also a compact growing plant that would become most popular in cultivation here, if we could get material! Included here is a photo of Andy holding a plant of this species ***Sobralia undatocarinata* var. *chica*** from Panama that is growing in live sphagnum moss, as well as an image showing the floral detail.


Sobralia undatocarinata var. *chica*

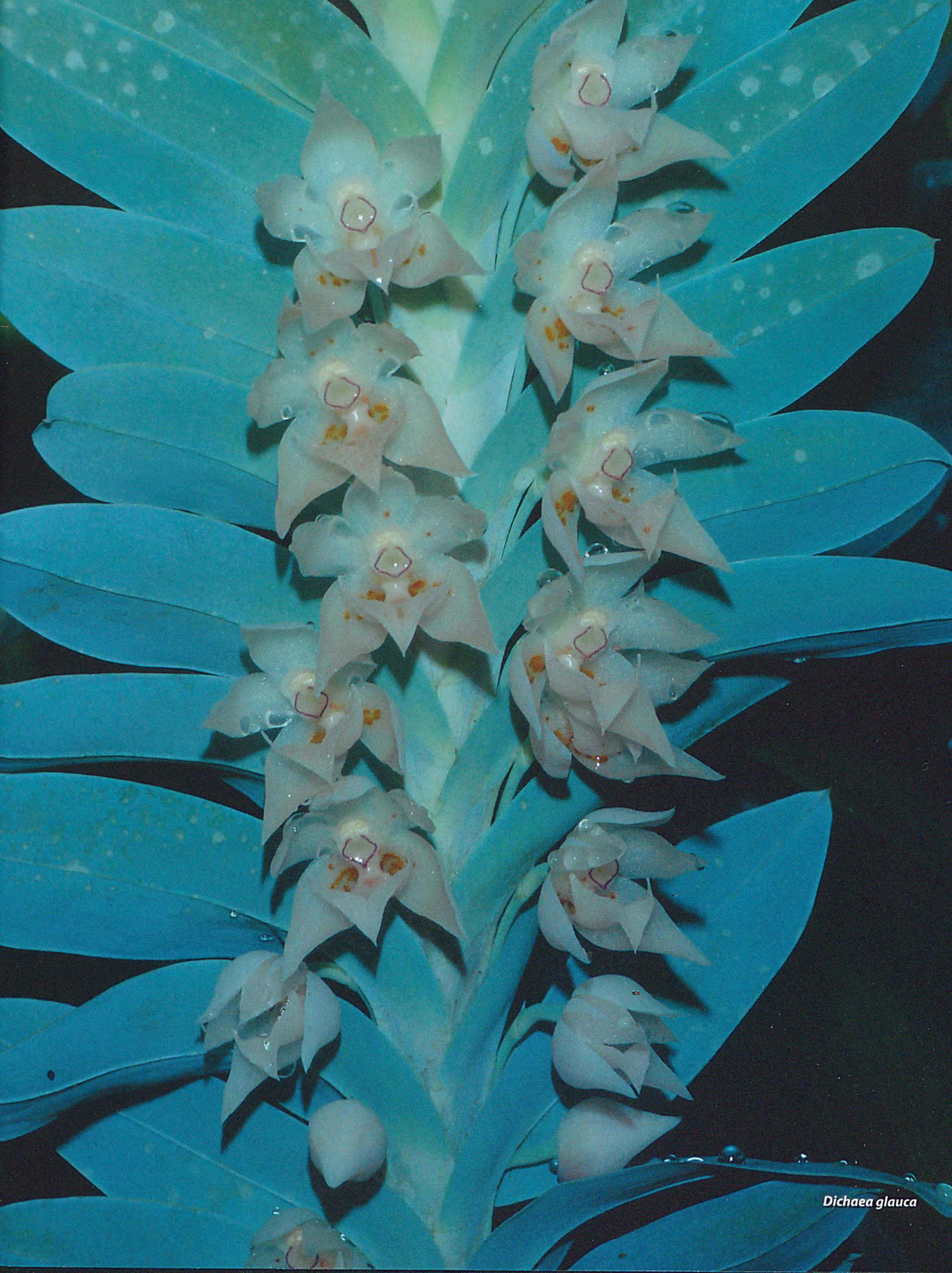
Andy holding *Sobralia undatocarinata* var. *chica*


Dichaea glauca

Dichaea glauca is an orchid you would readily grow just for its wonderful bluish foliage, with a plant that grows to around 50cm tall. It's from Mexico and Central America. I'm sure you could leave your fingerprint on the leaves due to its powdery texture.

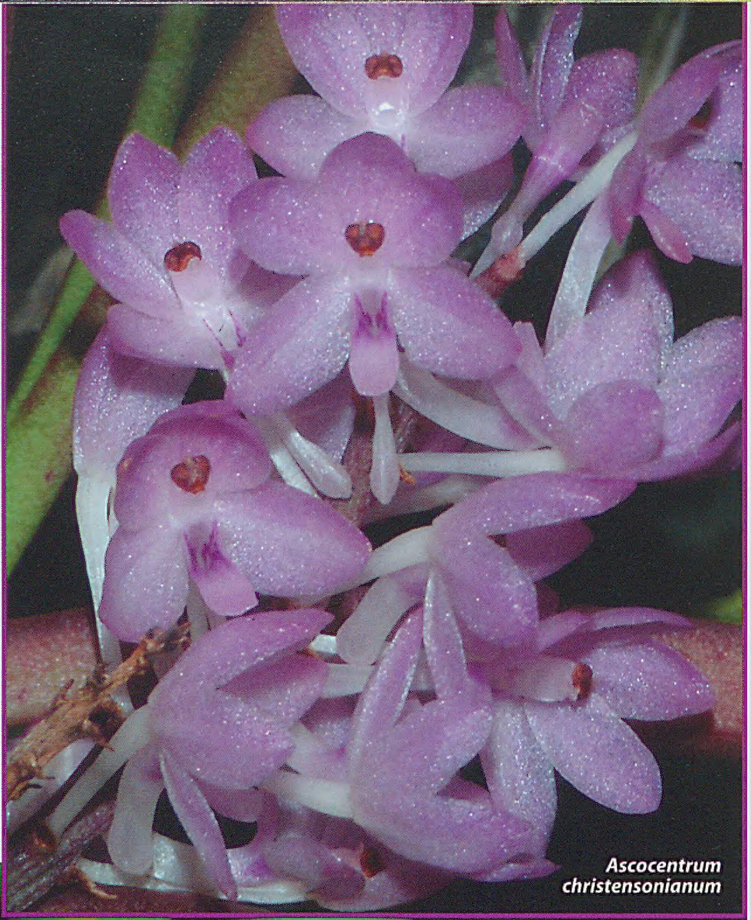
With such a diverse collection, there are epiphytes from all over the world, with an emphasis on orchids from the Tropical Americas. Some of these I will show in future issues.

He also has a large inventory of Asiatic orchid species, both epiphytes and a growing interest in terrestrials.

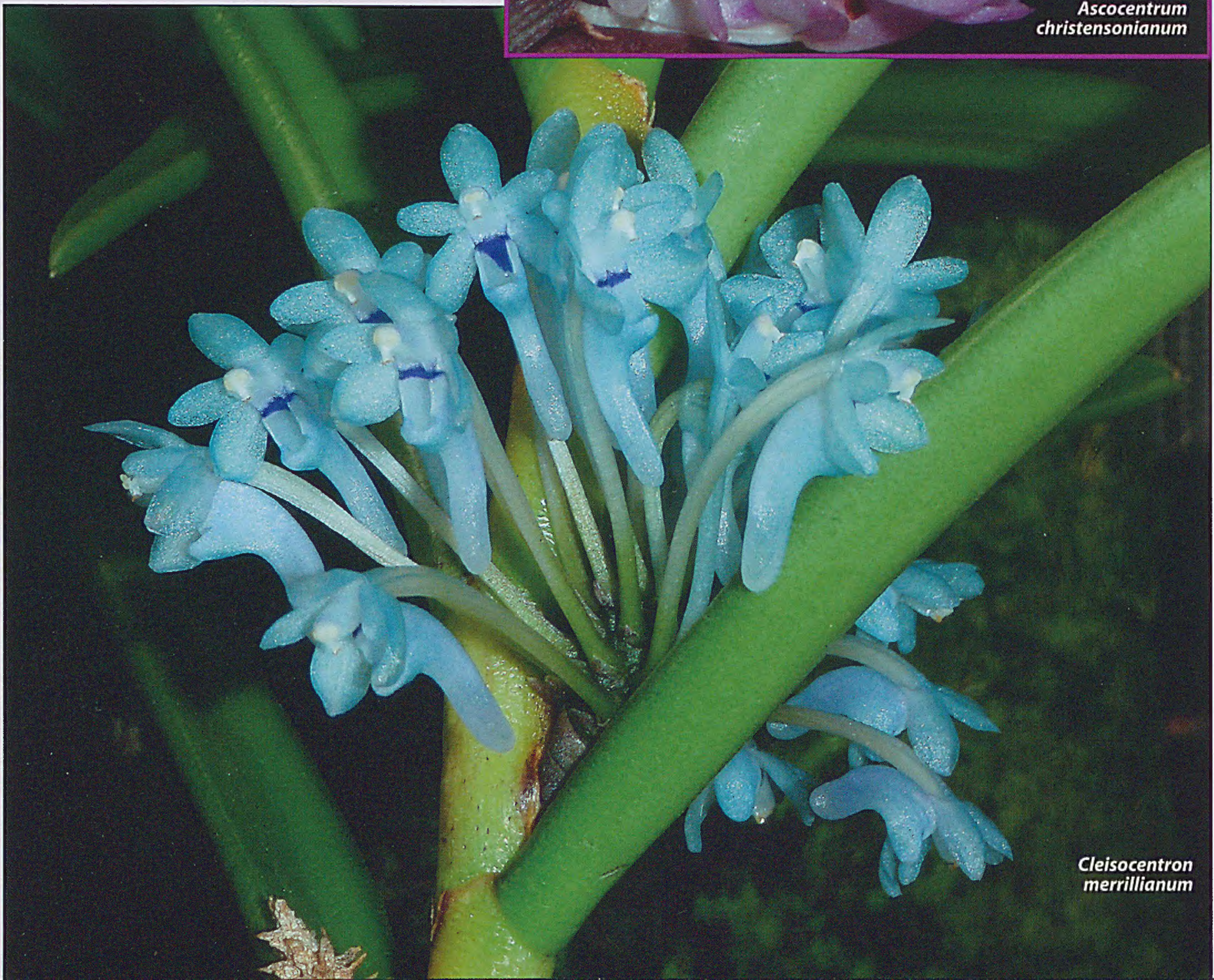


Dichaea glauca

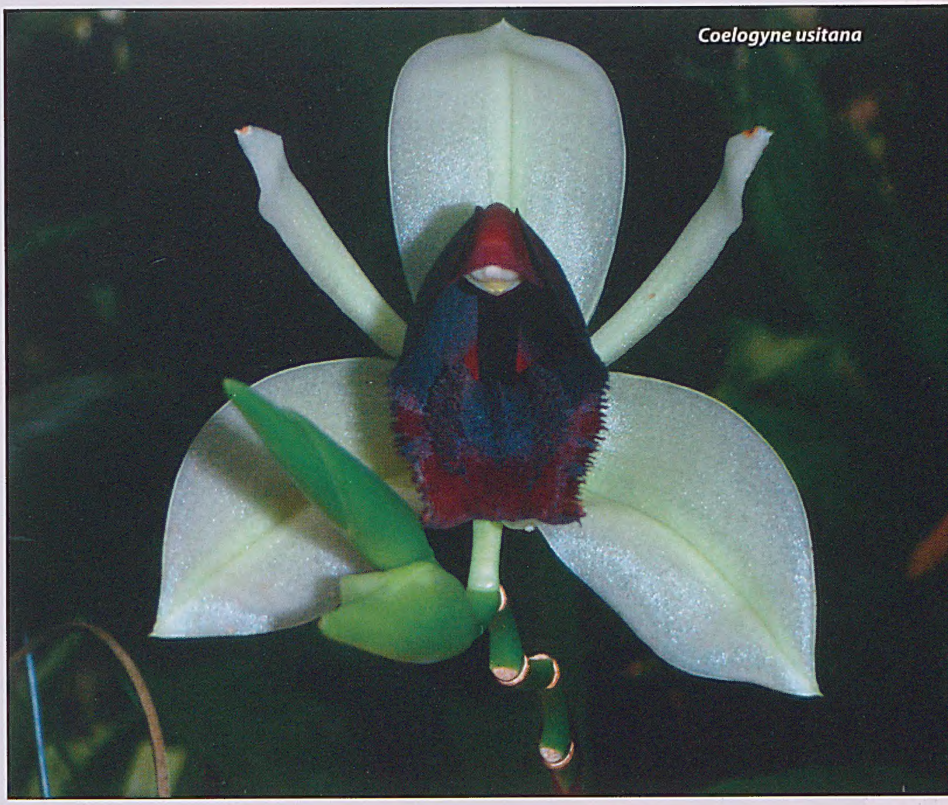
Ascocentrum christensonianum is a relatively recently (1993) described species from Vietnam, named after the late orchid taxonomist, botanist and researcher Eric Alston Christenson (1956–2011). Eric wrote the well-received *Phalaenopsis* monograph that was published in 2001 and his final opus, *Maxillaria an Unfinished Monograph* was published posthumously in 2013. I'm sure this delightful species will also be used in many miniature and compact growing Vandaceous hybrids in the future.


Ascocentrum christensonianum

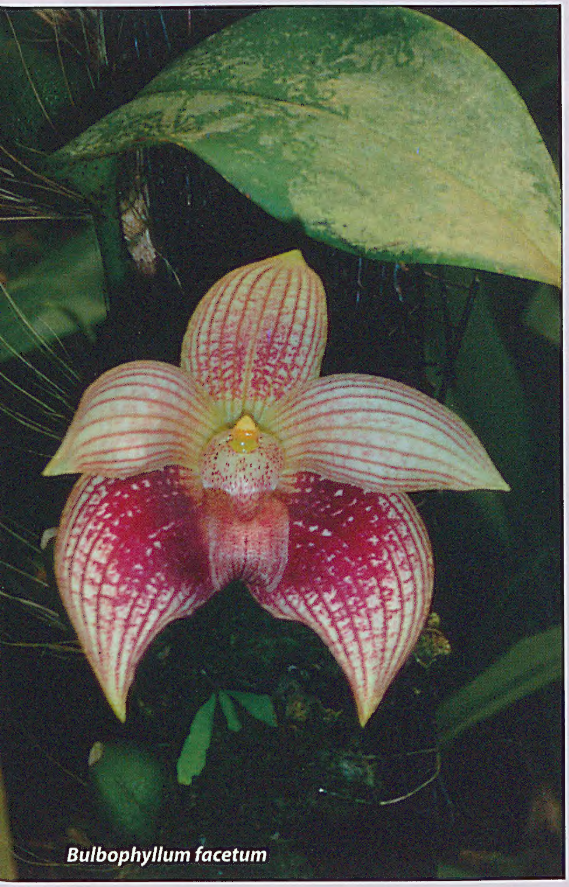
True blue is a rare colour in orchids. Ironically, ***Cleisocentron merrillianum*** was reclassified by Christenson in 1992, having previously been included at various times in the genera *Robiquetia* and *Sarcanthus*. This species is endemic to Sabah, Borneo and has the most delightful ice-blue flowers. It produces blooms throughout the year with a heightened flowering in the warmer months, with longer days.

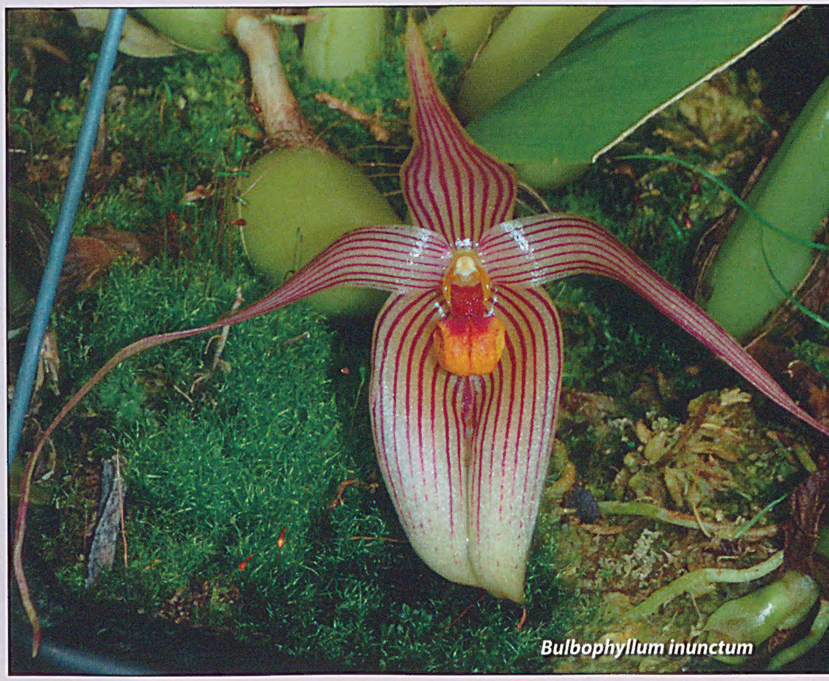

Cleisocentron merrillianum

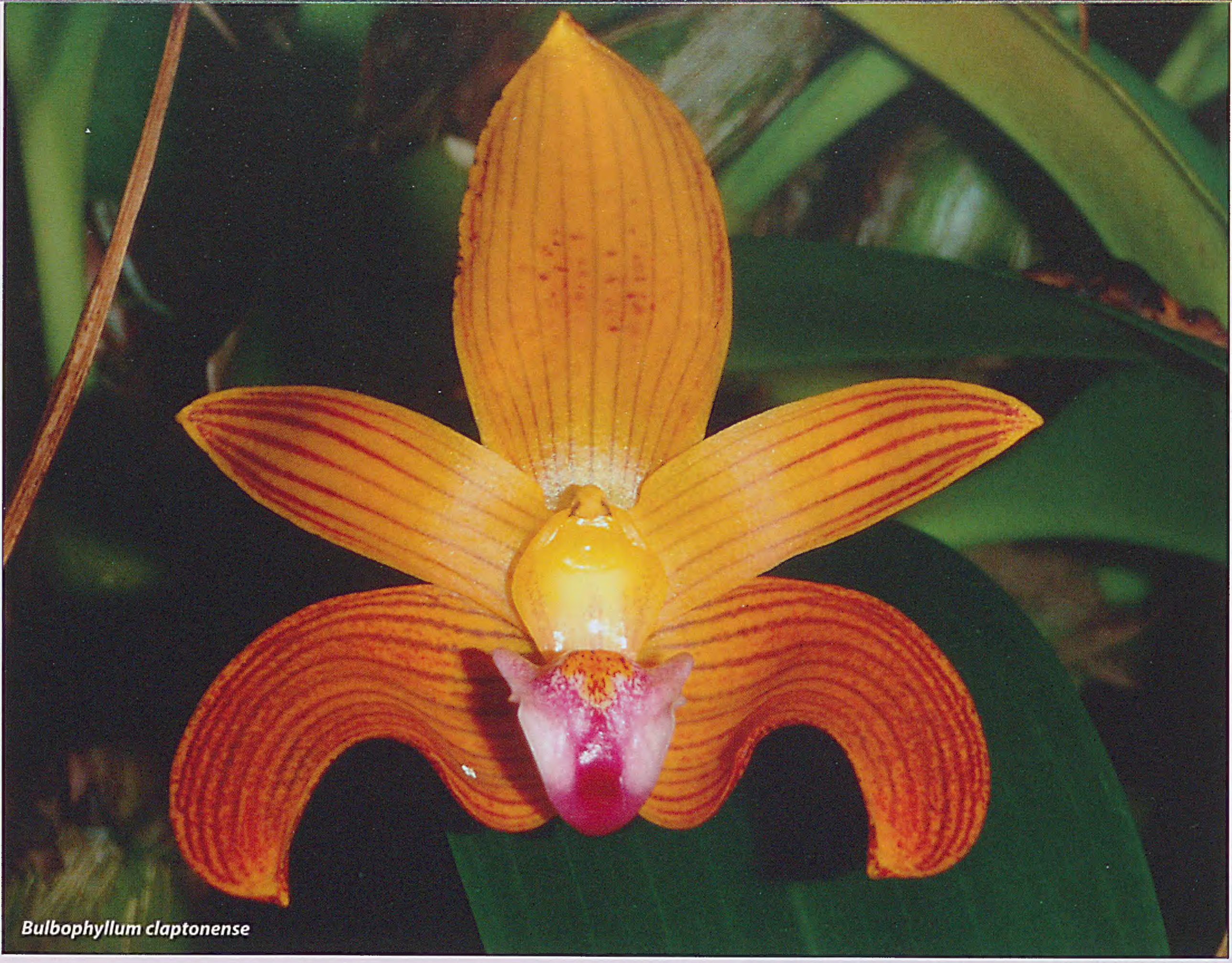
The genus *Coelogyne* has always been one of my favourites, and over the past couple of decades there have been new natural discoveries and well as an influx of artificial hybrids in cultivation that have increased in popularity. There are many wonderful orchid species from The Philippines with many new species being identified and described in recent times. Many of these have been facilitated by dedicated and focussed enthusiasts such as Jim Cootes who has done much to promote and record the indigenous orchids of this archipelago. ***Coelogyne usitana*** gives the illusion of a black and white flower, with its incredibly dark labellum. The flowers are produced sequentially on this orchid, which was discovered late last century and described in 2001. Its unfortunate (from a horticultural perspective) that the blooms don't display themselves well, basically looking at the floor! But I'm sure this set-up helps its pollinator, whatever it is. This species is part of Section *Speciosae* (hence closely related to *Coelogyne speciosa*).


Coelogyne usitana

Another wonderful Phillipine species from Section *Sestochilus* is ***Bulbophyllum facetum***, described in 1997 by Leslie Garay. The flowers tend to only open for a few hours in the middle of the day, being closed at night, before re-opening the next day. This ritual is repeated for between 3 and 7 days depending on temperature, light and humidity. From the same Section is the bizarre ***Bulbophyllum inunctum*** from tropical Borneo. I must say, the flowers smell like rotten fish, it's disgusting!


Bulbophyllum facetum


Bulbophyllum inunctum

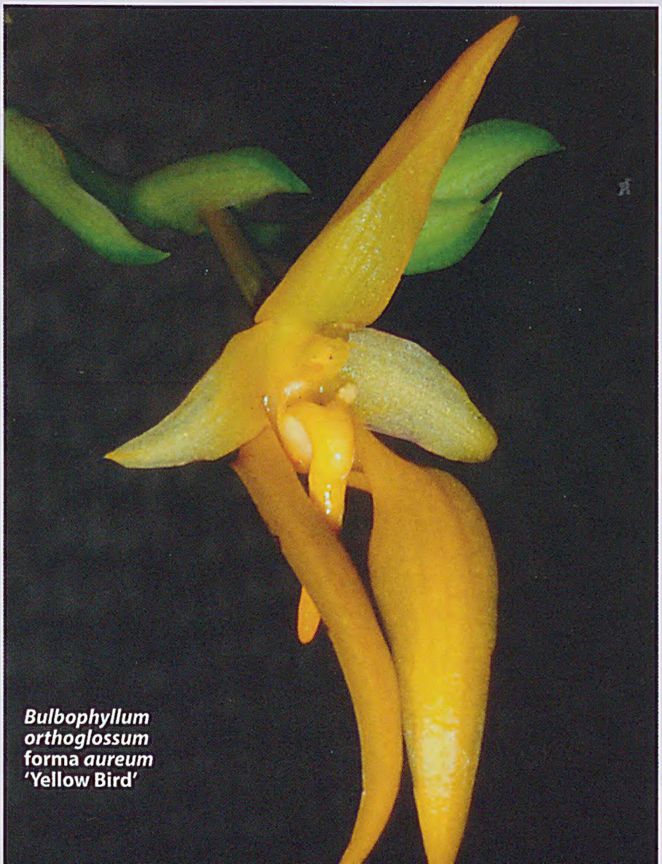


Bulbophyllum claptonense

SUNSET VALLEY ORCHIDS

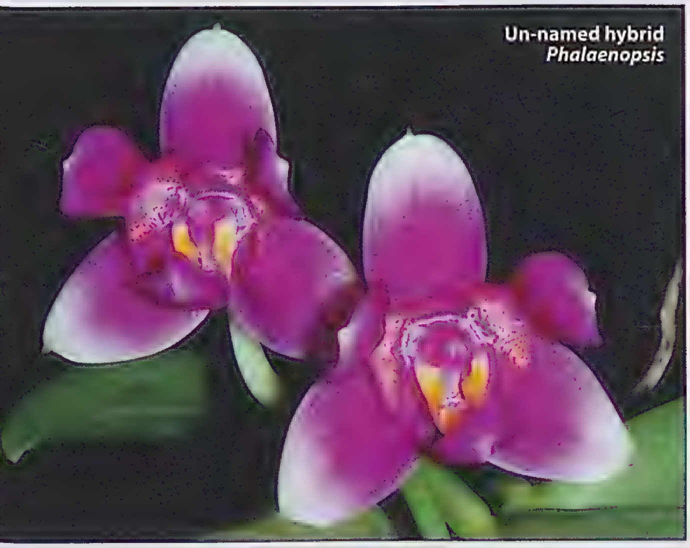
Fred Clarke owns Sunset Valley Orchids and has an amazing and varied collection of the highest quality orchids. He excels in the genus *Catasetum* and related genera, as well as compact and colourful *Cattleya* alliance hybrids. He also more than dabbles in *Paphiopedilum*, *Bulbophyllum* and of late Australian *Dendrobium* and *Sarcochilus* hybrids. Fred also has a vast species collection as well. He is a master grower and his plants are well groomed, strong and very healthy.

Bulbophyllum claptonense was previously included as a variety of the variable *Bulbophyllum lobbii*. This species has quite a pleasant, sweet fragrance and it's been suggested that it may be pollinated by a species of fruit fly. Another species that appears to be endemic to Sabah, northern Borneo. Albino forms of *Bulbophyllum* species are quite uncommon. This plant was labelled as ***Bulbophyllum orthoglossum* forma *aureum* 'Yellow Bird'**. I sometimes wonder if this species and *Bulbophyllum carunculatum* (1994) are variations of the same species, as I fear too much emphasis is placed on minor things such as "how many bumps are on the labellum", and if the describing authors have studied large populations of different plants (to see the natural variation) or simply seen two different plants. Some can be so blinkered that they can only see trivial differences, yet cannot see the plethora of similarities some of these so-called "different" orchids have! For the record, *Bulbophyllum orthoglossum* (1896) is the much earlier name and would take taxonomic priority if they were considered conspecific.

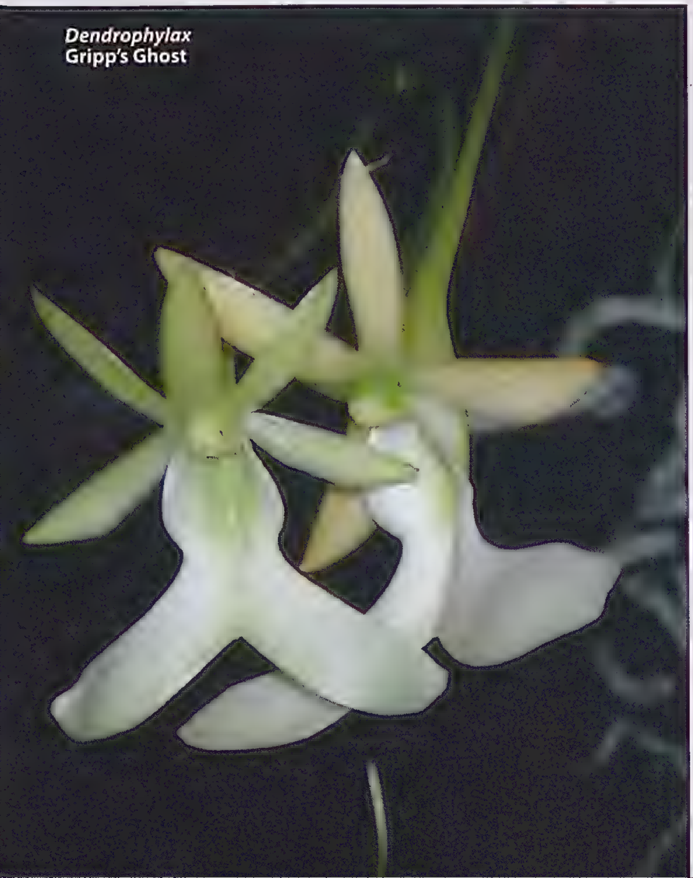


***Bulbophyllum orthoglossum* forma *aureum* 'Yellow Bird'**

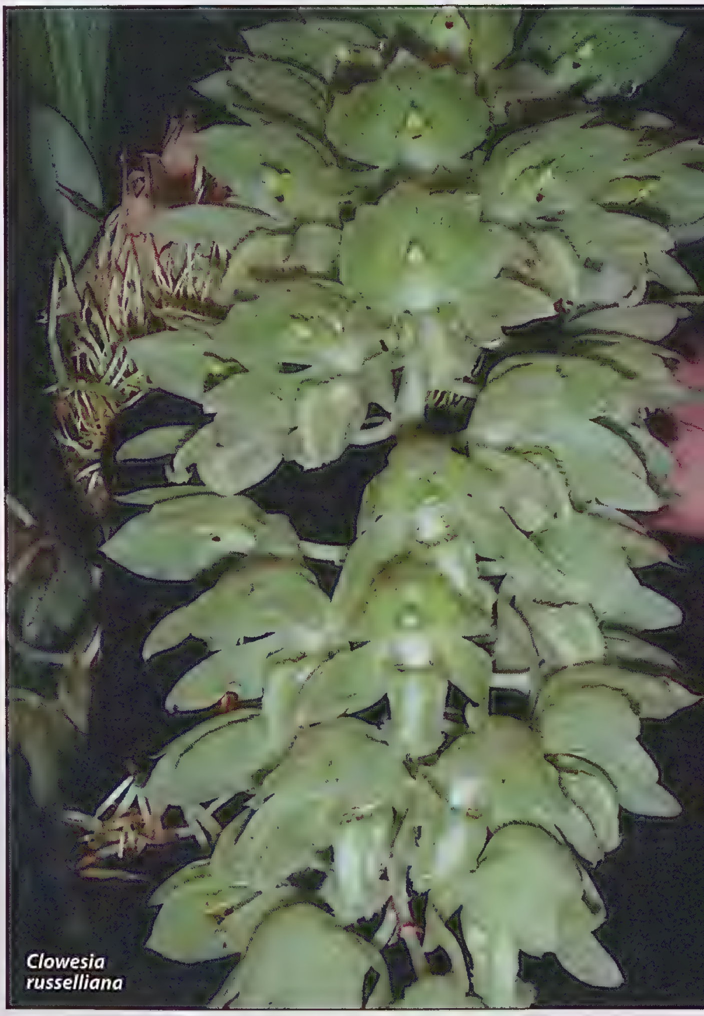
Peloric orchids are real novelties of the flower world. Some love them, others hate them. They always generate some comment, and in many cultures can also generate quite a bit of money to the right person. I thought this un-named hybrid ***Phalaenopsis*** to be quite interesting.


Un-named hybrid
Phalaenopsis

***Dendrophylax* Gripp's Ghost** is a rare primary hybrid between the famous Ghost Orchid *Dendrophylax lindenii* and *Dendrophylax funalis* – registered by the Santa Barbara Orchid Estate in 2001 and named after the Gripp family. Thankfully this unusual leafless orchid is a lot easier to grow than the notoriously temperamental Ghost Orchid. The cute flower looks like an icy-green children's doll.


Dendrophylax
Gripp's Ghost

The genus *Catasetum* produce either male or female flowers, generally at different times, off the same plant. However the closely related *Clowesia* doesn't have unisexual flowers, its blooms contain all the reproductive parts and are exceptionally showy and often floriferous. There are currently seven recognised and described species in this genus. ***Clowesia russelliana*** is a warm growing tropical species from Central America to Venezuela, producing long impressive inflorescences of numerous pale green blooms.


Clowesia
russelliana

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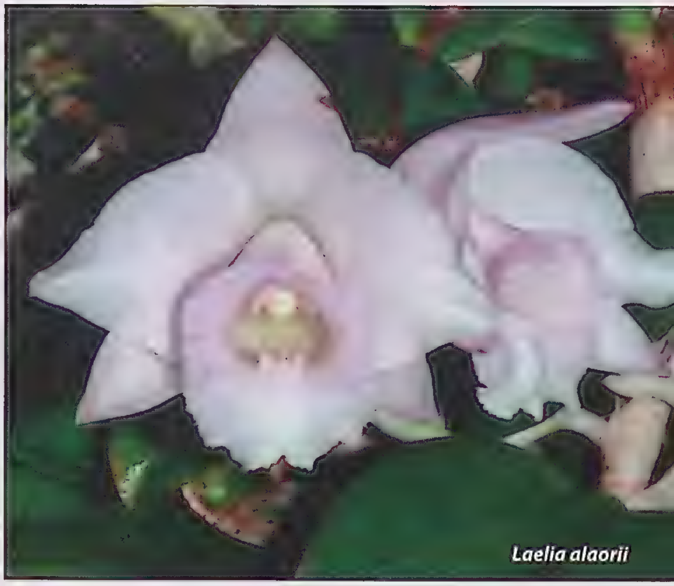
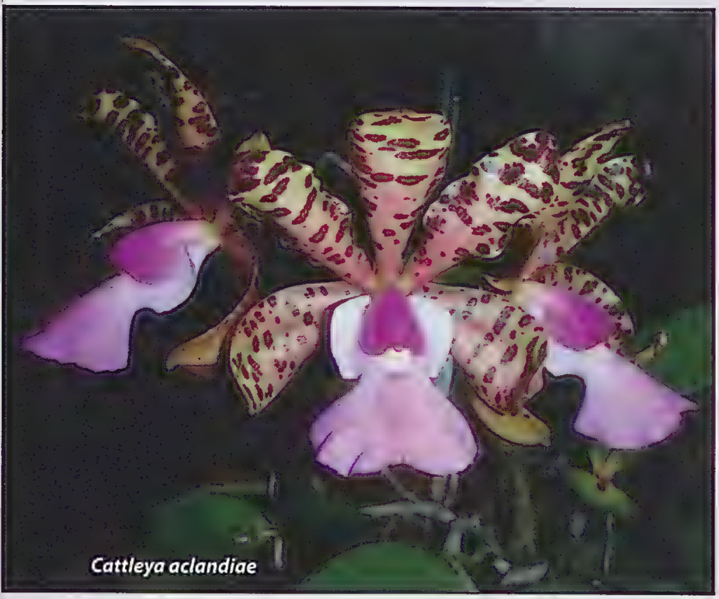
Most of us are aware of the inconsistent upheaval of names that have appeared over the past decade or so, "supported by DNA". Hopefully a truly global and unbiased committee can sort these generic names out sooner rather than later, as many orchid enthusiasts are throwing their collective arms up and losing interest. ***Laelia alaorii*** is a very rare and seldom seen species from Brazil that was described in 1976. It grows in very wet rainforest and is closely related to *Laelia pumila*.

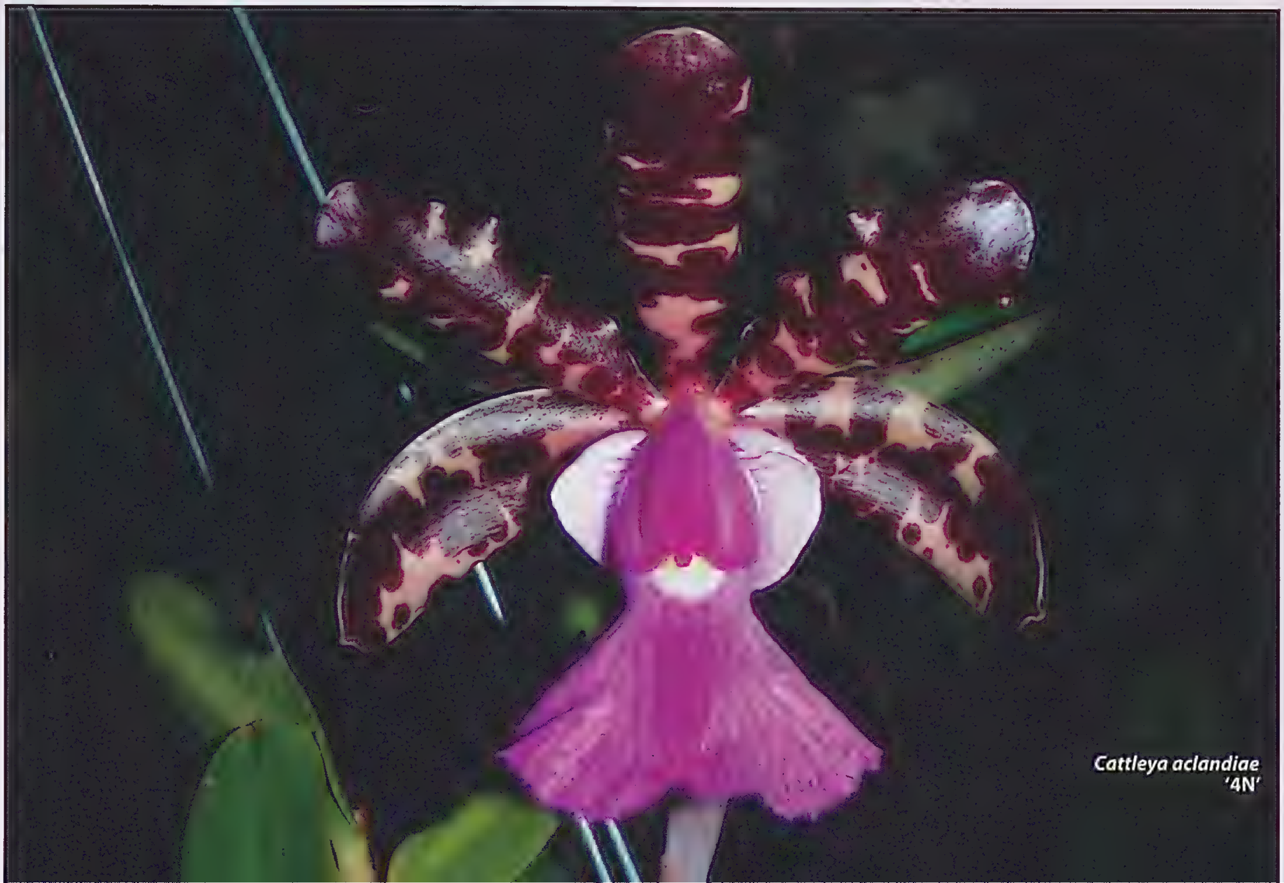


Laelia alaorii



Cattleya aclandiae

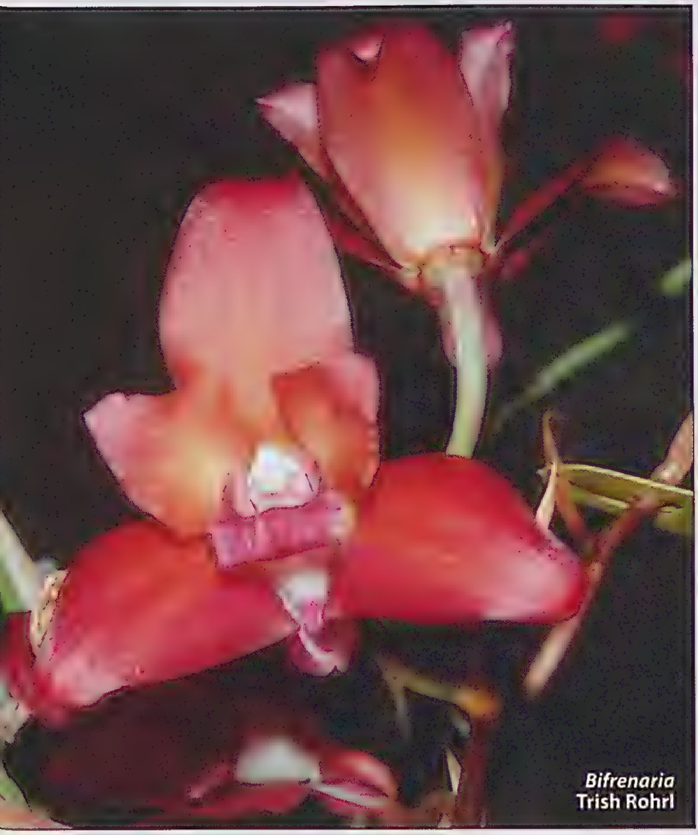
Fred has an amazing *Cattleya* species collection, in their various colour forms, with many of them tetraploids (4N) that also assists with breeding. He is also line breeding many of these species and makes outcrosses to produce new colours on robust plants. Having starting with a few wild examples of the species, he has developed a bank of exceptional ***Cattleya aclandiae***, some are highly floriferous, regularly producing three or four large glossy flowers. Another direction is to constantly breed for chocolate coloured flowers, and these darker colour forms of ***Cattleya aclandiae* '4N'** are breathtaking.



Cattleya aclandiae
'4N'

The genus *Euchile* was previously treated originally within *Cattleya* then later *Encyclia*. Most authorities recognise only two species, and this is the primary hybrid between them – ***Euchile* (*citrina* x *mariae*)**. I agree that the species used here are outstanding in their own right, yet this hybrid has a new charm all of its own.

I'm going to finish the discussion with a couple of new and interesting hybrids. There have only been a few *Bifrenaria* hybrids made and registered to date. One problem I have noted with a number of *Bifrenaria* hybrids, or intergeneric hybrids, is their reluctance to flower! The grex shown here, ***Bifrenaria* Trish Rohrl** is a primary hybrid between *Bifrenaria vitellina* and *Bifrenaria atropurpurea* registered in 2000. Interestingly, *Bifrenaria vitellina* is still frequently grown as *Stenocoryne vitellina*. This hybrid produces up the eight blooms on an upright to arching flower stem.



Bifrenaria
Trish Rohrl

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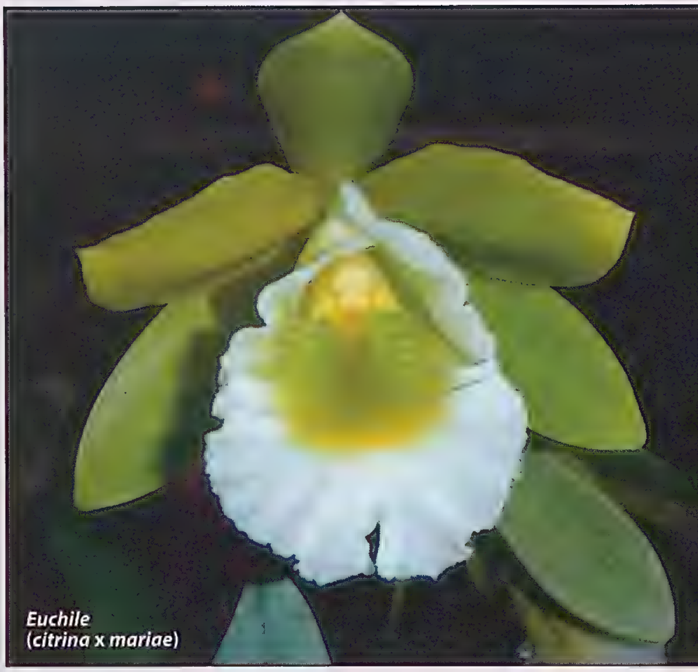

Euchile
(*citrina* x *mariae*)

Zygopetalum hybrids seem to go in and out of fashion every few years. The almost constant battle to keep the leaves clean and free of "black spots" tends to shy away many potential growers. This intergeneric hybrid ***Bleitzara* (*Zygopetalum* Advance Australia x *Galabstia* Green Tyger)** will adapt to both cool and warm climates, yet prefers to grow under a solid roof, where it will repeat bloom every time a strong new growth is produced. *Galabstia* Green Tyger is *Pabstia jugosa* x *Galeottia grandiflora*.

So just when you think you have seen all there is to offer in orchids, be prepared for surprises around the next bend... ■

David Banks
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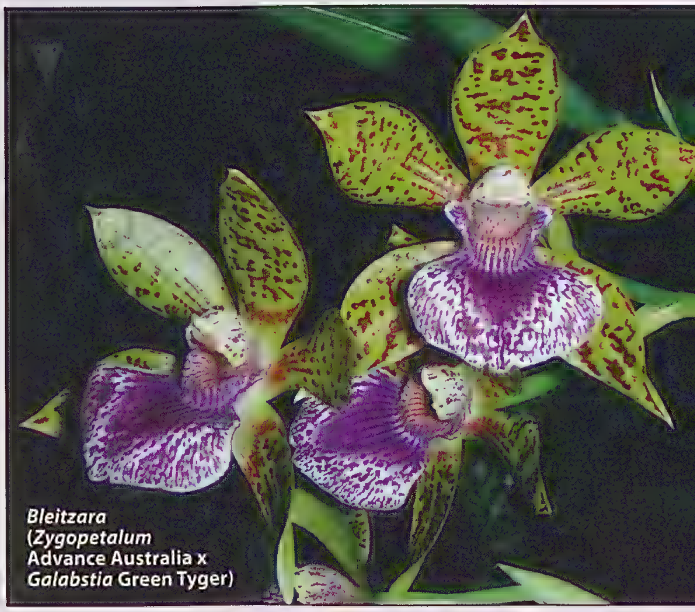


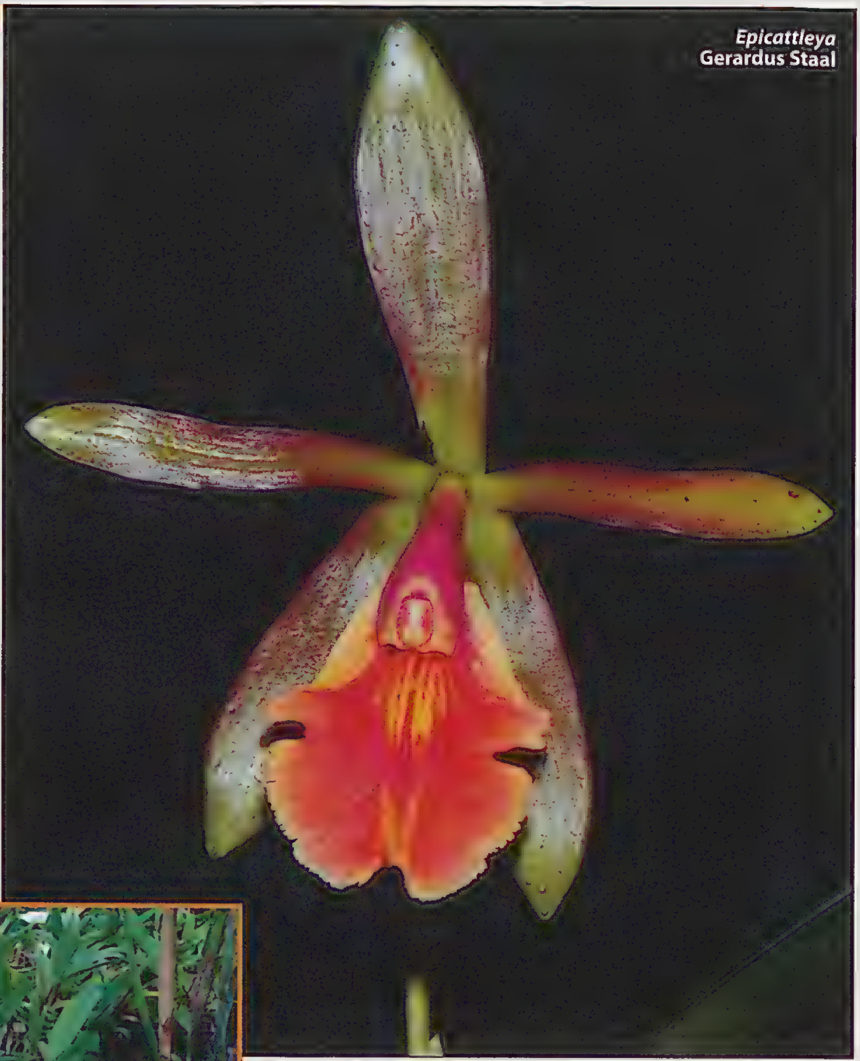
Bleitzara
(*Zygopetalum*
Advance Australia x
Galabstia Green Tyger)

Epicattleya Gerardus Staal

by Ray Clement

Epicattleya **Gerardus Staal** is an intergeneric primary hybrid between the species *Epidendrum pseudepidendrum* and *Cattleya schilleriana*. It was registered in 2002 by Woodstream Orchids in the USA, and named in honour of the late orchid hybridist Gerardus Staal (1925-2014) who owned Peninsula Hybrids. Gerardus produced many outstanding *Masdevallia* hybrids plus an eclectic mix of unusual pioneering hybrids within *Bulbophyllum*, *Dendrobium*, *Oncidium* and the miniature *Cattleya* alliance.

The compact *Cattleya* species parent has dramatically reduced the plant size, as *Epidendrum pseudepidendrum* may grow up to two metres tall under ideal tropical conditions. This hybrid is also tolerant over a wide range of conditions, and will grow and bloom in most frost-free climates. The plants start blooming with one or two flowers, with larger plants producing about five. Do not cut off the spent flower stems as we have found they will often elongate and produce extra blooms, often out of season. Late winter to early spring appears to be the main flowering time, with the glossy and waxy blooms long lasting.


Epicattleya Gerardus Staal

Epicattleya Gerardus Staal (mericlone plants, ready for larger pots)

Our plants are grown in pots without any artificial heating or cooling in basically a shadehouse with a solid fibreglass roof. Essentially this orchid likes similar conditions to the *Cattleya* family.

We currently have limited numbers of near-flowering sized mericlones in 80mm pots (but ready for larger ones) in our latest catalogue for $15 each. These should bloom with the next new forward growth later in the year. ■

Ray Clement
Tinonee Orchid Nursery
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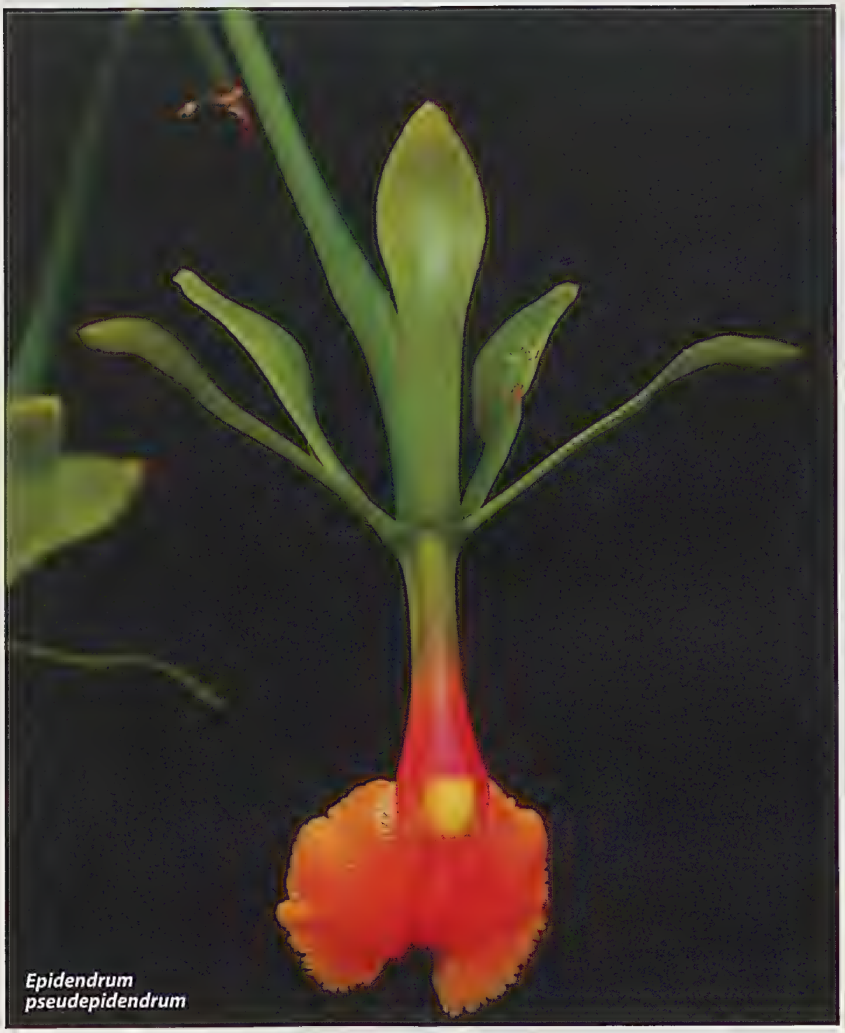
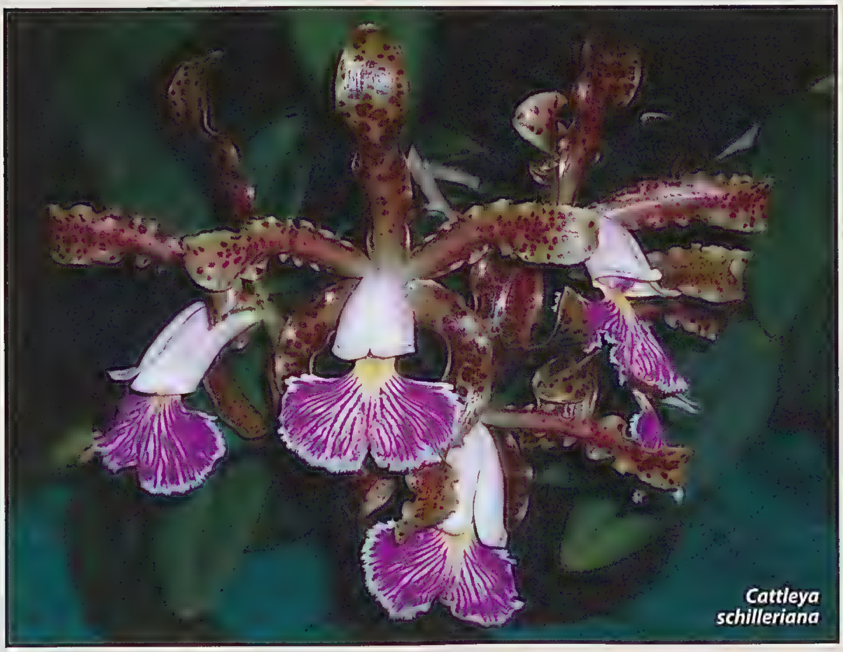
Email: orchids@tinoneeorchids.com
Website: www.tinoneeorchids.com



Epidendrum pseudepidendrum



Cattleya schilleriana

Australian Orchid Review

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A GUIDE TO NATIVE ORCHIDS OF SOUTH WESTERN AUSTRALIA

Second edition – revised and expanded

Bob Liddelow 2015

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NEW ON THE BOOKSHELF:

Pests, Diseases, Ailments and Allies of Australian Plants

This book is an introduction to some of the good, bad and interesting creatures that you might find in your garden. With aids to their identification, symptoms and recommendations for control.

Amateur and professional gardeners, horticulturists, commercial nurseries and students will find this book invaluable. *Pests, Diseases and Ailments and Allies of Australian Plants* is an authoritative reference on pests, diseases and nutritional disorders of Australian plants, with many of these most applicable to orchids, both native and exotic.

This book describes over 300 introduced and native pests and diseases, with the authors being acknowledged experts in this field. To find out what pest or disease is causing a problem, simply check the chart for symptoms. Each symptom is cross-referenced to the text, with colour photographs and detailed line drawings of pests, insect life cycles and damage symptoms on plants to help identify your problem. All common and uncommon problems suffered by Australian plants are covered in this book, with each pest being listed with its physical description, regional occurrence, host plants, habits and control methods. The emphasis is on natural rather than chemical control so that your plants and garden benefit from minimal ecological interference.

Pests, Diseases and Ailments and Allies of Australian Plants is a complete reworking of an earlier 1986 book by Jones and Elliot. This new work is a must-have book for anyone gardening in Australia, whether you grow orchids, Australian plants or exotics.

The book is divided into eleven parts, categorising the various and extensive list of pests and diseases, with numerous subheadings, plus heaps of sharp photographs and line drawings to further aid confident identification.

It starts off with seven pages of 'Photo Short Cuts' so you can start to get an idea of what kind of things cause what kind of damage. Some are serious and need control, but some are not and should be tolerated.

There is also a section on beneficial insects and animals, as it's good to know who your friends are, as well as your enemies! Some of the candidates here will surprise you. Far and away the most important part about controlling pests and diseases is to know what's damaging your plant. Curiously, it's the bit most of us gloss over, preferring to reach for a spray that's a grab-bag of control rather than sitting down, examining the plant carefully, diagnosing, identifying, and then working out the best course of remedial action. Or working out that no remedial action is needed.

Each listed pest then has the following subheads – Description, Climatic Regions, Host Plants, Feeding Habits, Notes and Control, so you are in no doubt whether the critter described is what you've got, and what to do about it.

Not just a reference book, as the photographs throughout are superb – crystal clear and detailed, thanks to the many high calibre contributing photographers, like Tony Wood, Chris French, David Beardsell and Max Sutcliffe, and also to the fine printing done by the publisher. The line drawings by Trevor Blake and David Jones are also detailed and first class.

At $45.00, this book is a relatively inexpensive addition to the Australian gardener's library and one that will provide you vast knowledge and a feeling like you're more in control of what's going on in your garden and orchid collection. ■

Authors: David Jones, Rodger Elliot and Sandra Jones
Publisher: Reed New Holland (2015)
Paperback with PVC covering: 440 pages (260mm x 185mm)
ISBN: 9781877069970
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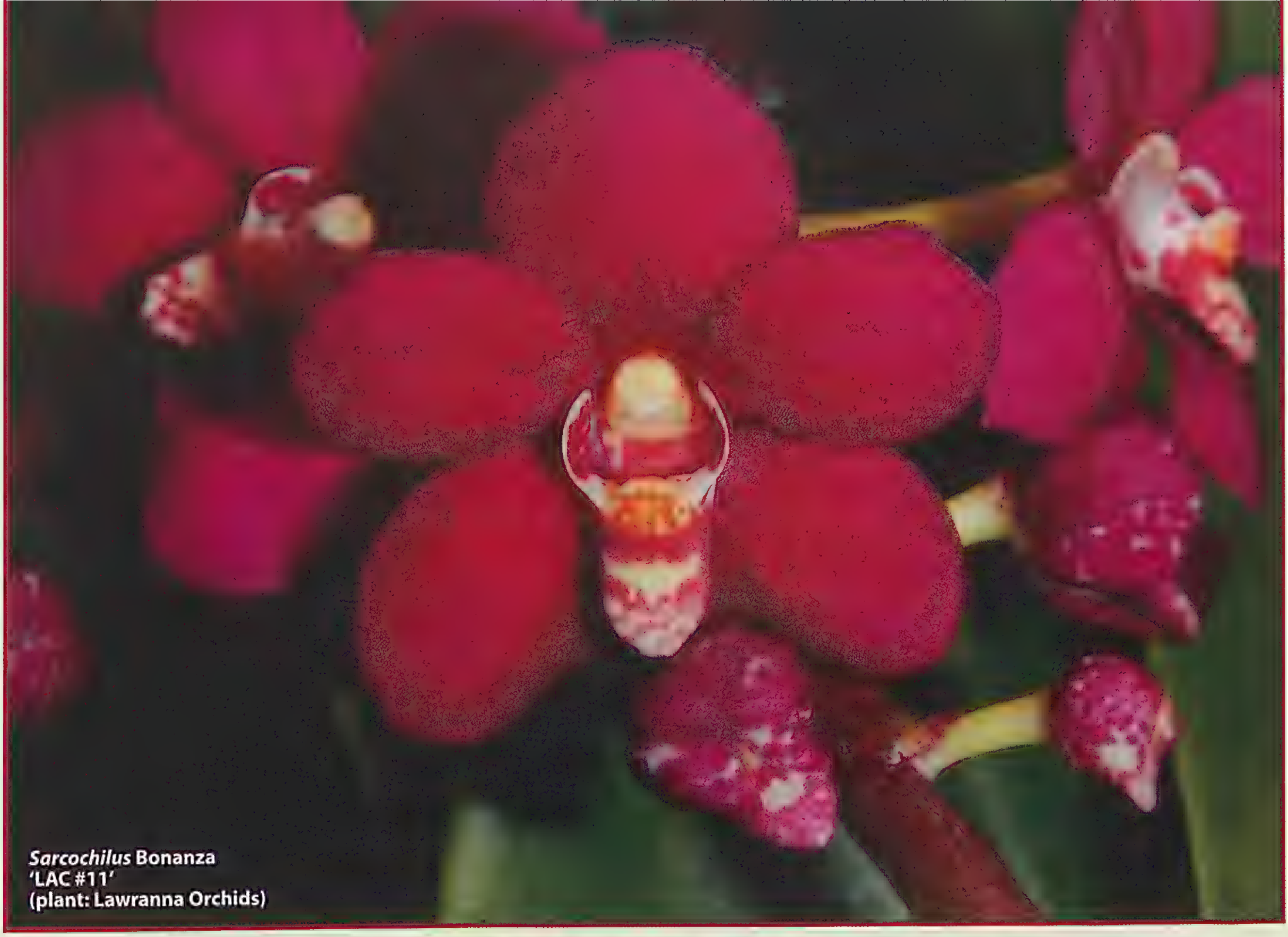

***Sarcochilus* Bonanza**
'LAC #11'
(plant: Lawranna Orchids)

Sarcochilus Bonanza

Text and photos by David Banks

***Sarcochilus* Bonanza** is a hybrid between *Sarcochilus* Fitzhart (*fitzgeraldii* x *hartmannii*) and *Sarcochilus* Velvet (Nicky x Riverdene) that was registered by H.L. McDonald in November 2008. This hybrid had been subsequently made/remade (often in reverse formula) by David Butler of Green Vista Orchids as well as the late Neville Roper and late Brian Gerhard.

Both parents of *Sarcochilus* Velvet have half of their pedigree contributed by *Sarcochilus hirticalcar*, the rare epiphytic "Harlequin Orchid" from North Queensland. *Sarcochilus* Nicky (*fitzgeraldii* x *hirticalcar*) and *Sarcochilus* Riverdene (*hartmannii* x *hirticalcar*). The floral shape is primarily derived from *hartmannii*, the colour from *fitzgeraldii* in its darker forms, the labellum shape and extended flowering period, plus resistance to botrytis from *hirticalcar*. There is also obvious hybrid vigour, as many examples of this and other *hirticalcar* hybrids produce more flowers on the inflorescence than any of the species parents in the background. They will also bloom almost any month of the year. The brown colours in *hirticalcar* when crossed with pinks also intensify the shades, by essentially producing layers of "darker" colour. Similar colours are produced when dark brown forms of the "Tangle Root Orchid" *Plectorrhiza tridentata* are used on *Sarcochilus* with pink and pale purple tones. Similarly with many *Sarcochilus australis* and *Sarcochilus spathulatus* hybrids. The reds we are now seeing in these modern *Sarcochilus* hybrids are unlike any of the true colours of the parent species in their genetic backgrounds.

Interestingly *Sarcochilus* Riverdene was the first hybrid made and registered with *Sarcochilus hirticalcar* back in 1976 by Noel Jupp, of Riverdene Nurseries, East Gresford, NSW. I remember going there as a young teenager with my parents and twin sisters, and seeing *Dendrobium* Star of Gold (*falcorostrum* x *tetragonum*) for the first time, and Dad buying seedlings of some of those (to become famous) "pink lipped" forms of *Dendrobium tetragonum* var. *giganteum* – the ones that are behind almost every spidery pink/purple native *Dendrobium* today with a solid purple labellum. This would have been around 1978.

Sadly they have long been out of orchids, but the nursery still exists on the same site! Riverdene Nurseries is a family orientated business that was started by Noel and Virginia Jupp in 1956. Initially the business was started as an adjunct to the families grazing interests and concentrated on the production of *Cyclamen* seedlings for the nursery trade and in the cultivation and development of Australian Native Orchids.

Indoor and foliage plants were later introduced to the business followed by a few selected Australian native plants. Over time the production of *Cyclamen* was phased out in favour of the more popular natives. When consumer interest and demand for Australian native plants began to increase, the owners used their long standing expertise with Australian natives to expand the nursery to grow large numbers of these plants.

It's a shame that Noel Jupp suddenly dropped off the native orchid landscape. He had an amazing collection, was a skilled orchid hybridist with foresight way ahead of his time and produced many wonderful hybrids that are still relevant and sought after today. He also pioneered *Dockrillia* hybrids.

Now back to *Sarcochilus* Bonanza. When on a brief visit to Adelaide, South Australia in conjunction with the National Cymbidium Show in August 2015, I saw the cultivar *Sarcochilus* Bonanza 'LAC #11' on display for the first time. It's also one of these few quality *Sarcochilus* that have been successfully mericloned/tissue cultured (using the end of the inflorescence). I was quite impressed with the vibrant knockout colour and its obvious vigour. The main display plant was starting to produce offsets at the base of the plant, and there was evidence of flowering off every leaf axil. This plant was owned by one of the *Cattleya* vendors at the show, Anna Christesen from Lawranna Orchids, Beechworth, Victoria. I bought one of the well grown and robust flowering-sized mericlones and look forward to blooming it myself later in the year.

David Banks
Hills District Orchids
Seven Hills / Northmead, NSW
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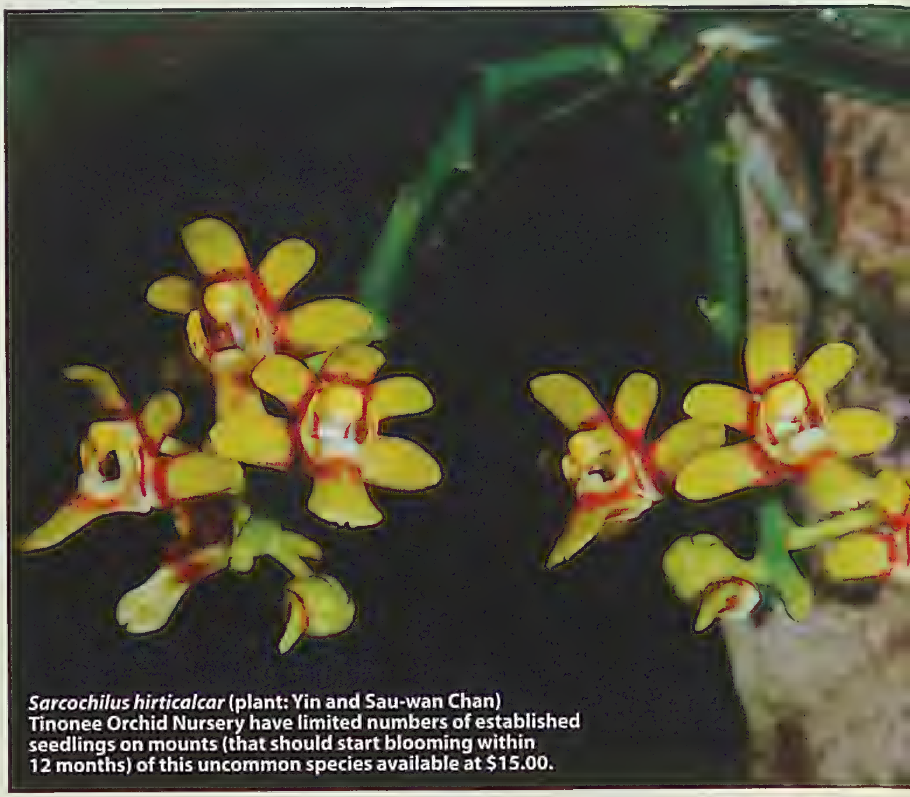

Sarcochilus hirticalcar **(plant: Yin and Sau-wan Chan)**
Tinonee Orchid Nursery have limited numbers of established seedlings on mounts (that should start blooming within 12 months) of this uncommon species available at $15.00.

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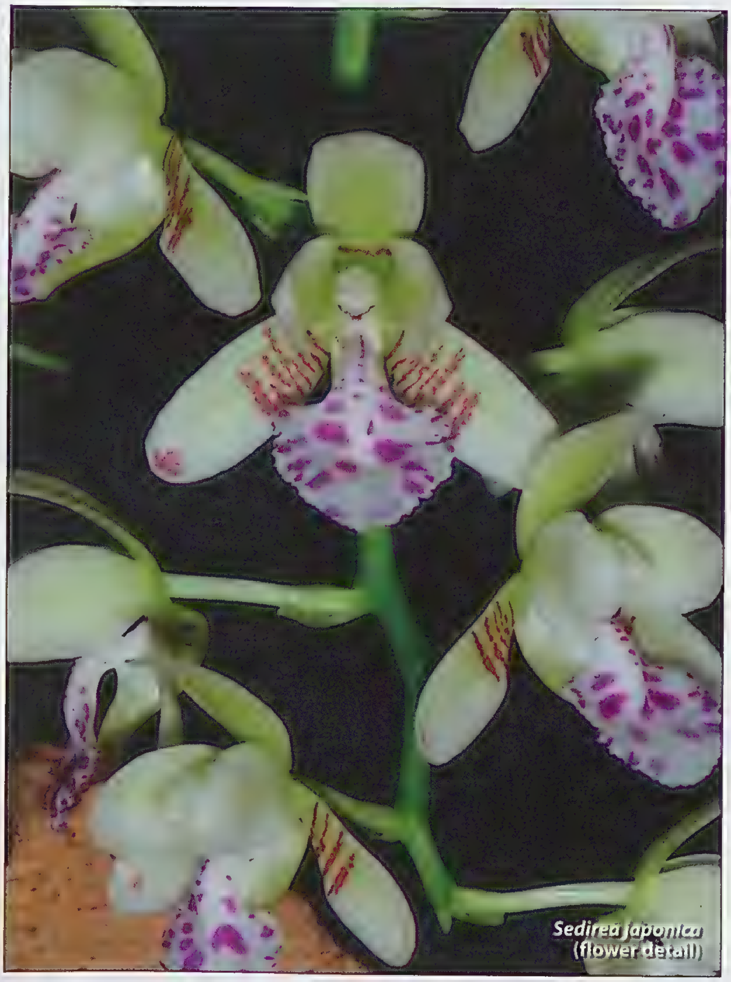
AOR 009

Sedirea japonica

by Ray Clement


Sedirea japonica (flower detail)

Sedirea japonica is native to sub-tropical regions of southern Japan and Korea. This is a miniature growing monopodial species with a *Phalaenopsis*-like leaf habit. In fact, in 2014 it was transferred to the genus *Phalaenopsis* (as *Phalaenopsis japonica* (Rchb.f.) Kocyan & Schuit. in *Phytotaxa* 161: 67) but this move has had poor acceptance in horticultural circles. It was previously included within the genus *Aerides*, with its new generic name simply being *Aerides* spelt backwards, not quite a palindrome! Surprisingly there are few *Sedirea* hybrids with other related genera, even though there would be much untapped potential.

For us on the New South Wales mid north coast, it always blooms around the Christmas – New Year holiday season. The 40mm flowers have a very strong citrus scent, reminiscent of lemons, with up to a dozen produced together on an arching inflorescence. All visitors who have smelt this at the nursery have fallen in love with it, never a person who didn't like it! Which is somewhat unusual as most fragrances polarise people, for both males and females. The blooms last, depending on how hot the days are, for between two and three weeks. Larger plants produce multiple flower stems.

Our plants are grown without any artificial heating or cooling in basically a shadehouse with a solid fibreglass roof. Essentially this orchid likes similar conditions to most *Sarcochilus* and *Neofinetia*. They will take the occasional cold evening but will not tolerate frosts (like most epiphytic orchids). It prefers bright shade with high humidity coupled with lots of circulating fresh air.

Our stock plants are mounted on cork rafts like the one in the photograph, and they do grow well that way, suspended at about head height. We find they develop and maintain a better and more extensive root system as slab plants grown as true epiphytes. (Same as *Sarcochilus falcatus* that does not like to be grown in pots). Young plants out of flask grow very well in 50mm tubes, but we find the plants can lose vigour if they stay in the same pot for too long and the potting medium becomes stale. Now is a good time to move them onto cork rafts – in a horizontal position.

For those who love highly fragrant orchids with pretty flowers that are just a bit different, then *Sedirea japonica* is for you. We currently have limited numbers of lovely near flowering sized seedlings in 50mm pots in our latest catalogue for $10 each. ■

Ray Clement
Tinonee Orchid Nursery
Tinonee (near Taree), NSW
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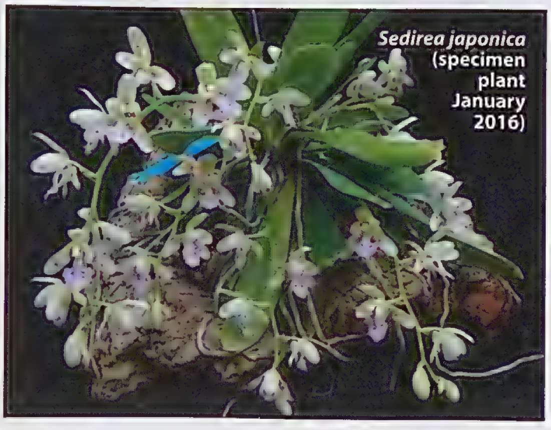
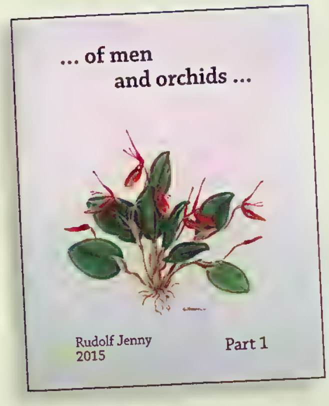
Website: www.tinoneeorchids.com


Sedirea japonica (specimen plant January 2016)

NEW ON THE BOOKSHELF:

...of men and orchids...

(Part 1)



The human history of orchids has long been a neglected topic when compared with the information available on the natural history of this fascinating group of plants. Nonetheless, orchidology, both on the scientific and the horticultural sides, has expressed a number of pre-eminent figures, whose contributions are often appreciated and broadly used with no cues about their creators.

Rudolf Jenny's "*...of men and orchids...*", is neither a book on how humans grow orchids nor a treatise of how they classify plants, but an extraordinary look at the bond that unites men – botanists, gardeners, plant hunters, explorers – to the names of orchids and the histories behind their discovery and scientific apprehension. The work is a great step into the realm of history, and orchids are the perfect excuse to expose the efforts, the courage and bravery, the ambition and jealousies, and the indomitable will of those men in the flesh who have made it possible to discover and name the amazing diversity of plants.

Each of the 41 chapters that compose the volume tell the story of an orchid (or a few orchids) and a man, beginning with *Acineta beyrodtiana* and Otto Beyrodt, going through complete biographical sketches of the protagonists and discussing the sometimes complex taxonomy of the concerned orchid species. You will find very acknowledged names in plant history, like the Loddiges and Wendland dynasties, or botanists of the eminence of Eduard Friedrich Poeppig and Achille Richard, or famous explorers like Kegel and Jenman, but you will be also surprised at finding several less known names who compose the extraordinary story of orchidology. Vriese, Comparetti, Haller, Raddi, Loefgren, Lauche and Brade, Moquette and Hasskarl, are just a few of the many characters that are presented in the book, together with the orchids that immortalize their names. The sound of these names is often somewhat familiar to the passionate of orchids, because it echoes in the name of the plants that we study and cultivate, and Rudolf Jenny's book has the merit of giving them – often for the first time – a face, a place and a story. They are botanists, taxonomists, plant-collectors, growers and voyagers who, over more than a century, contributed to our knowledge and appreciation of orchids.

The texts, synthetic without being dry, and extraordinarily informative, are accompanied by an excellent and generous selection of illustrations, shown in full colour, including portraits of historical characters, ancient drawings, paintings, type specimens and engravings, watercolours or simple sketches of the concerned plants, as well as sharp photographs of their modern counterparts, mostly taken by the author himself. The whole is superbly packed into a beautifully designed and printed volume.

"*...of men and orchids...*" is an entertaining and instructive lecture, which benefits of the vast experience of the author in both the areas of orchid taxonomy and botanical history. The only criticism I would express to this superb book is the lack of a real frontispiece, which will probably cause some headaches to the responsible for cataloguing in the large libraries where this work will surely find a place.

This was privately printed by the author, with hundreds of photographs, historical illustrations and portraits. Because the edition is quite limited, I warmly suggest the interested readers trying to secure a copy soon. According to the author, this first volume will be followed in the coming years by two, or maybe three more. I, for one, am already hungrily waiting for the next volume.

Franco Pupulin
(Orchid Curator at the Lankester Botanical Garden
in San Jose, Costa Rica.)

To fully endorse Franco's comments and articulate review, ***...of men and orchids...*** is a superbly researched and produced book. The quality of the paper, printing and colour reproductions is outstanding. It is a heavy text with strong binding. Rudolf has an amazing knowledge and recall of orchid history and is also a serious collector of orchid literature. He knows the kind of "feel" and "look" he searches for in books and this work is to be commended for its high standards. The author is well known in Australia as an expert on *Stanhopea* and *Gongora* and for his numerous historical and taxonomic articles he has had published here, both in the *Australian Orchid Review* and *Orchids Australia*. The orchid species and stories in the book are recounted in alphabetical order, not on a regional or related basis. Orchid species native to Tropical America dominate this volume, however there are also numerous species treated from Asia. Sadly (my bias coming through now!) no Australian species are treated (not even under the *Phalaenopsis amabilis* entry). However, who knows what future volumes may provide us. ***...of men and orchids...*** is a wonderful opus for the serious species orchid enthusiast and those interested in orchid history and adventure, with its graphic trials and tribulations.

DPB - January 2016

(Rudolf Jenny is chemist by training and was active in environmental and ozone-technology until his retirement in 2008. He has been working with orchids for more than 40 years, had a large collection of tropical orchid plants until 1995. Over many years, he has travelled in Central and South America in connection with his studies in pollination ecology and taxonomy. He has published some 450 articles in many of the world's leading orchid journals and published monographs of the genera *Gongora*, *Stanhopea*, *Paphinia* and *Sievekingia*. He is a regular lecturer at conferences around the world and owner of one of the most complete orchid libraries in private hands. He maintains BibliOrchidea, the world's largest and free accessible database for orchid literature with more than 165,000 entries, covering about 90 % of the existing literature. He is research associate at the Jany Renz Herbarium, University of Basel, Switzerland and honorary member and secretary general of the European Orchid Council. In addition to orchids, cave-climbing has been a hobby for many years.) ■

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Pot in Pot Growing Technique

by Sam Cowie

One of the problems that epiphytic orchid growers face is maintaining humidity. Given that we seek to grow epiphytic orchids in pots, maintaining humidity around the root system can become problematic without making the potting mix too damp that root growth may be inhibited or damaged by one of the root rot fungi or bacteria. The other problem is when that epiphytic root growth goes beyond the pot and out into the open air, thus requiring a suitably humid environment to stop root tips drying out. We can maintain humidity in our greenhouses by several methods, either through the use of irrigation, misters, foggers, and even greenhouse construction. But how do with maintain humidity around specific plants in a small collection that may require higher humidity than their surrounding brethren? Well the Pot in Pot technique is a great way to provide high humidity around a specific orchid's pot and root system, with the added benefit of spacing your plants out.

The Pot in Pot technique uses a terracotta pot and saucer to provide a humid environment around your orchid's pot and root system. First off you need to purchase a suitable terracotta pot that will provide at least 25 to 50mm around the pot that your orchid is growing in. The example that I've used is a 230mm terracotta pot to house a 140mm squat pot. Next you'll need a suitable terracotta saucer that works with your selected terracotta pot, which in the example is a 210mm saucer. Purchasing a larger saucer will increase the water reservoir that produces the humidity, thus minimising your time spent refilling the saucer. Finally you'll need a 5mm to 10mm gravel (e.g. Blue Metal) that goes into the bottom of the terracotta pot that will prevent your orchid pot from sitting in water. Although I used 10 to 20mm gravel in the photographed example, a finer 5mm to 10mm gravel will give you a much more stable base on which to sit your orchid pot.

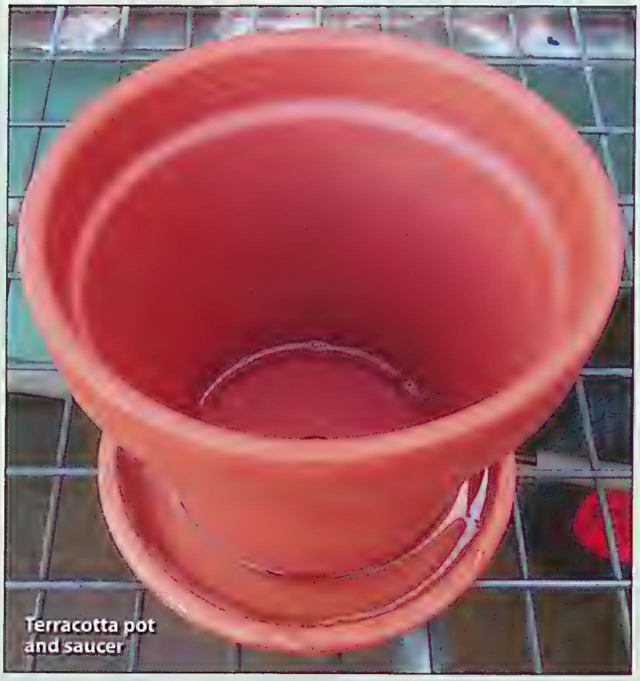
First off wash your gravel in a suitable sieve to remove any grid, dirt and fine material so that the gravel is nice and clean. Clean gravel will minimise disease. Next place your selected terracotta pot in the terracotta saucer and fill with water. Once the water level has stabilised in the pot with the external level of the saucer, mark the inside of the terracotta pot about 20 to 25mm above the water line. Now add the gravel up to the level you have marked. This insures that no matter how full the saucer is the gravel will always keep the orchid pot above the water. You want to make sure that the gravel isn't too high inside the terracotta pot that the orchid pot is sitting above the lip of the terracotta pot; otherwise you won't achieve a humid enough environment. For best results have the gravel layer so that the top of the orchid pot is sitting 5mm to 10mm below the lip of the terracotta pot.

The water will soak up into the terracotta pot and evaporate, as well as evaporating up through the gravel to create a high humidity environment around the orchid pot sitting inside the terracotta pot. All you need to do is top up the saucer each day to maintain the humidity. Another added benefit is that the Pot in Pot technique provides a cooler environment around the root zone of the orchid, which can be significantly beneficial with some types of orchids in warmer environments or during hot weather. ■

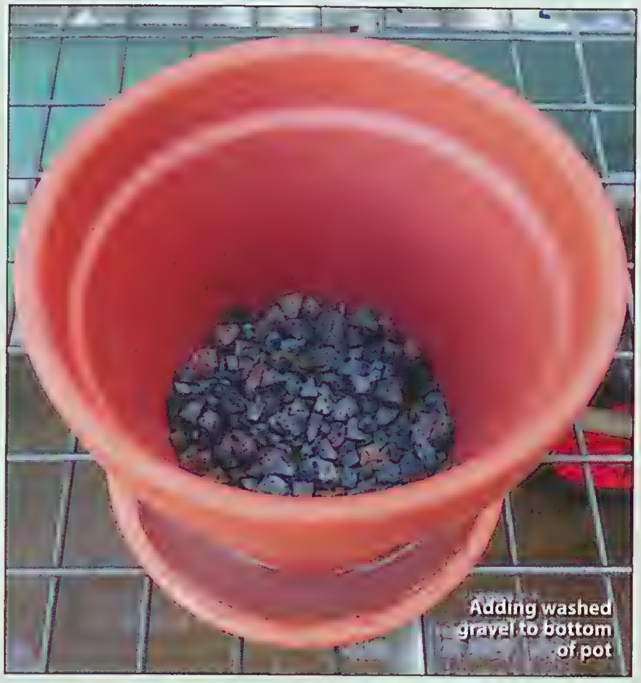
Sam Cowie
Kin Kin, Qld

Getting your materials ready: terracotta pot and saucer, gravel and water

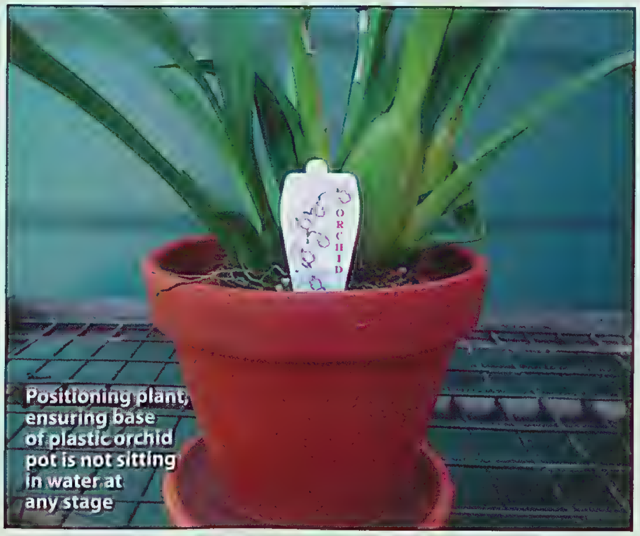
Washing the gravel using a sieve



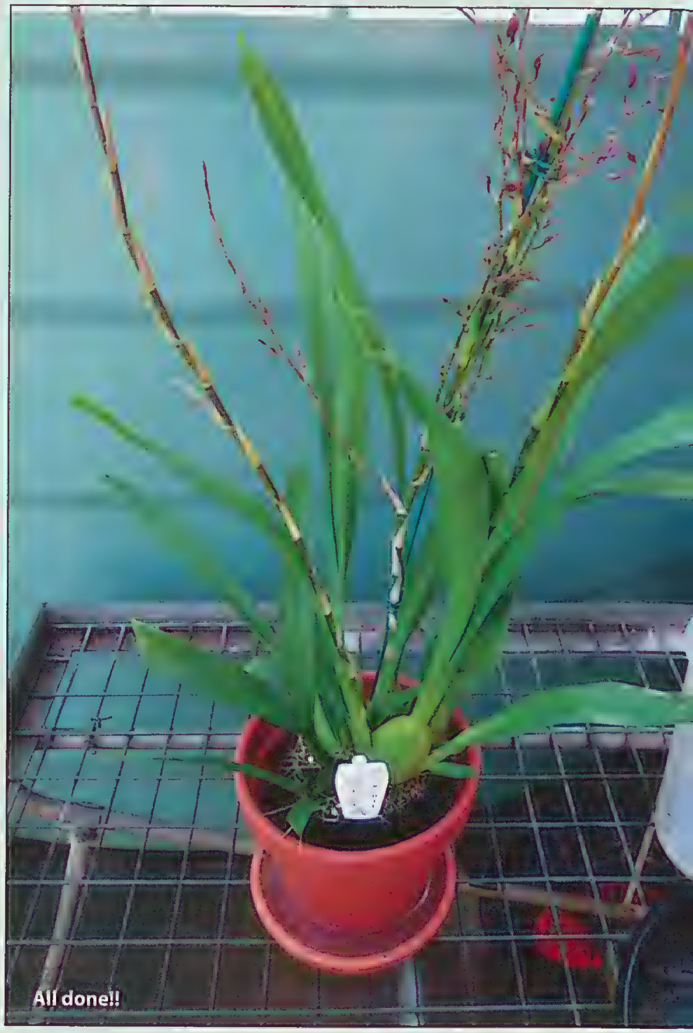
Terracotta pot and saucer



Adding washed gravel to bottom of pot



Positioning plant, ensuring base of plastic orchid pot is not sitting in water at any stage



All done!!

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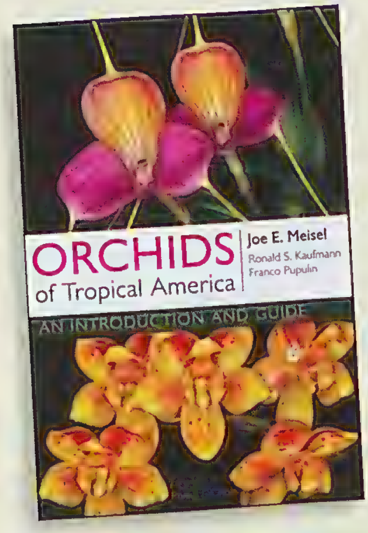
NEW ON THE BOOKSHELF:

Orchids of Tropical America: An Introduction and Guide



"The authors of this introductory text are acknowledged experts on tropical American orchids with decades of combined experience of orchids in both the wild and culture. You could not find a better trio of enthusiasts and specialists to introduce you to the wonderful and occasionally bizarre world of tropical American orchids." — from the Foreword by Phillip J. Cribb.

Orchids of Tropical America is an entertaining, informative, and splendidly illustrated introduction to the orchid family for enthusiasts and newcomers seeking to learn about more than 120 widespread orchid genera. Joe E. Meisel, Ronald S. Kaufmann, and Franco Pupulin bring alive the riot of colours, extraordinary shapes, and varied biology and ecology of the principal orchid genera ranging from Mexico and the Caribbean to Bolivia and Brazil. Orchids, likely the most diverse family of plants on earth, reach their peak diversity in the tropical countries of the Western Hemisphere, including, for example, more than 2,500 species in Brazil and 4,000 in Ecuador. The book also highlights reserves in the American tropics where travellers can enjoy orchids in the wild.

Whether you journey abroad to see these unique plants, raise them in your home, or admire them from afar, this book offers fascinating insights into the diversity and natural history of orchids. Beyond the plant and flower descriptions, *Orchids of Tropical America* is packed with informative stories about the ecology and history of each genus. Pollination ecology is given in detail, with an emphasis on how floral features distinctive to the genus are linked to interaction with pollinators. This book also features information on medicinal and commercial uses, notes on the discoverers, and relevant historical data.

The quality of the photography is simply outstanding. Many of the images were taken by the authors (in particular Ron Kaufmann) with major contributions from respected species orchid authorities and ace photographers Ron Parsons (who also took the front cover shots: www.flowershots.net) and Andy Phillips (of Andy's Orchids, California fame). You can also be very confident about the identifications provided being correct. I really enjoyed this book and I'm sure other species orchid enthusiasts, growers and students will feel the same.

The easy-to-use identification system permits quick recognition of the most common orchid groups in Central and South America. Genus descriptions are given in plain language designed for a non-scientific audience but will prove highly useful to advanced botanists as well. Descriptions focus on external morphology, and great care has been taken to ensure the guide is useful in the field without reliance on microscopes or dissections. Equally valuable as a field guide, a desktop reference, or a gift, *Orchids of Tropical America* will make an excellent addition to any orchid lover's library.

Visit the website for this book at www.orchidsoftropicalamerica.com

Available from Cornell University Press or Amazon.com at US$75.00 (hardcover) or US$29.95 (softcover).

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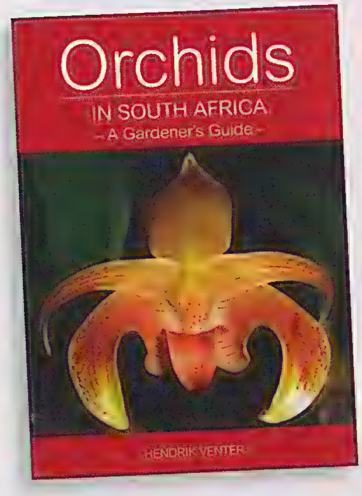
NEW ON THE BOOKSHELF:

Orchids in South Africa: A Gardener's Guide



Hendrik Venter is an accredited South African Orchid Council judge and moved to Melbourne, Australia in 2009 and subsequently becoming a judge for the Australian Orchid Council. He has been admiring and growing orchids for almost four decades. He was also the Editor of the *SAOC Magazine* for six years.

It contains chapters on Orchids and their history; Basic botanical information on orchids; General growing information, and Repotting and dividing of orchids. There is also a very interesting section showcasing many of South Africa's showy and unique indigenous orchid species.

The 192 page book is Softcover, with integral binding, full colour throughout, with close to 400 colour photographs and illustrations. For some reason some images were duplicated through the book. Overall the quality of the photos is very good, with sharp focus and correct exposure. The nomenclature used throughout is a combination of traditional and "new" taxonomy, which I am sure will confuse and frustrate some readers. Personally I found the approach somewhat inconsistent. Some genera are happily split (such as *Pleurothallis* and *Oncidium*), whereas some very different orchids are lumped together under *Dendrobium*, and *Vanda*. Thankfully misidentifications are rare (photo on page 156 is *Dendrobium farmeri*, not the rare *D. palpebrae*) and there are only a few hiccups with nomenclature (*Dendrobium speciosum* var. *windermere* being such an example – should be *Dendrobium speciosum* 'Windermere'). On page 138, the plant labelled as *Phalaenopsis amabilis* is actually *Phalaenopsis aphrodite* subsp. *formosanum* (the labellums are VERY different). Sadly many judges still get this species confused. Thankfully such errors are scarce and do not detract at all from the intent of the book.

Orchids in South Africa - A Gardener's Guide is a no nonsense, down to earth book which makes a great introduction for those new to the orchid hobby or those who simply wish to expand their knowledge. Obviously targeting the South African market, this book has information pertinent to orchid growers throughout the world. The book shows new and existing growers how to care for their orchid plants. Learn how to treat your orchids (and most commercially available orchids are quite easy!), water and feed them, how much shade or light they need, and how you need to grow, maintain and propagate them to prosper and flower regularly. Many species are discussed in detail, and the accompanying photographs of the species and a selection of popular hybrids will assist you to identify the different kinds, and also show you what other species you may be able to grow in the conditions you are able to provide.

Limited copies of this excellent cultural book (there are no book distributors for this title in Australia) may be obtained direct from the author by email to orchidfundi@gmail.com

Henk will advise book (price influenced by global exchange rates – but around AUD$30.00) and postage costs plus payment methods.

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THE AUSTRALIAN ORCHID FOUNDATION

Essay Competition 2015 1st Prize Winner

"How do you manage your Orchid Collection without relying on artificial heating and/or cooling?"

A Low Tech Shade-house for Growing Orchids in a Climate of Extremes

by Brian Dear

Growing a diverse range of orchids in inland regions of southern Australia is a challenge with a climate unsuitable for all but a few hardy genera. However that's part of the fascination and challenge of orchid growing, successfully growing spectacular flowering plants from exotic locations with climates vastly different to ours. It's a huge leap from the high altitude cloud forest environments of the Andes in South America to the relatively arid inland areas of southern New South Wales with its Mediterranean like climate and cold winters.

It is an even larger challenge to grow them without the expense of additional heating and cooling from external sources or a climate controlled glasshouse. Most of the published literature on orchid culture, often from the United Kingdom and the United States, lists the optimum growing temperatures for many orchids, including the cooler growing types, as falling between 12°C and 28°C. Similarly, humidity levels of between 50% and 80% are quoted as optimum with statements that humidity should never be allowed to fall below 40%. If these limits were taken at face value, growing most of the unique and fascinating orchid genera from Asia and the Americas would be beyond our reach.

Fortunately this is not the case and published temperature and humidity requirements should really only be regarded as being the 'optimum values' as orchid growers have been able to push the boundaries well beyond these accepted limits. Plants may not grow as rapidly or flower as profusely outside their 'optimum' temperature range, but they can still be very rewarding for those willing to have a go and not be discouraged by the very demanding requirements often quoted.

The climate at Wagga Wagga in southern New South Wales, where I and my fellow orchid society members grow our orchids, experiences a temperature range from -6°C to 45°C. On average there are 14 days in July with a minimum ground temperature below -1°C. Mean temperature figures are not a reliable guide to the growing conditions, however, as it is the extremes that are the real temperatures that plants must cope with, as an unexpected frost, which can occur over an 8 month period, or a week of exceptionally high temperatures and very low humidity in summer, can decimate an orchid collection. A quick browse of Table 1 below demonstrates the potential to experience both very high and very low temperatures over many months of the year at Wagga Wagga. It also shows how mean monthly temperatures mask the magnitude of the range in temperatures experienced which are better demonstrated by the daily maximum and minimum values. The mean number of days with ground temperatures below -1°C shows the significant potential for frosts for each month.

Table 1. Monthly mean maximum and minimum temperatures and daily high maximum and low minimum temperatures and number of days where ground temperatures are below -1°C at Wagga Wagga, New South Wales.

	J	F	M	A	M	J	J	A	S	O	N	D
Monthly mean max	32	31	28	23	17	14	13	15	18	22	26	30
Monthly mean min	16	16	13	9	6	4	3	4	5	8	11	14
Daily high max	45	45	40	35	27	23	23	27	32	36	43	43
Daily low minimum	3	2	3	-2	-4	-5	-6	-5	-4	-2	0	3
Mean number days with ground minimum below -1°C	0	0	0	2	7	11	15	12	8	3	1	0

Based on the table, the climate would appear to significantly limit the number of orchid species that could potentially be grown in this environment, however local orchid growers have in fact successfully grown a wide range of species often with only reasonably simple structures and devices to reduce the impact of high and low temperatures to create a more favourable microclimate. This gave me the incentive to persevere.

My goal was to construct a shade house with materials that I was capable of erecting with basic carpentry skills, was relatively inexpensive to build and had nil running costs with only passive heating and cooling, but afforded me the opportunity to grow a wide variety of orchid species. Most of the ideas incorporated were gained from researching articles on the web, books and helpful advice from local orchid growers. The key features of the shade-house which consists of a treated pine frame covered in shade-cloth are described below.

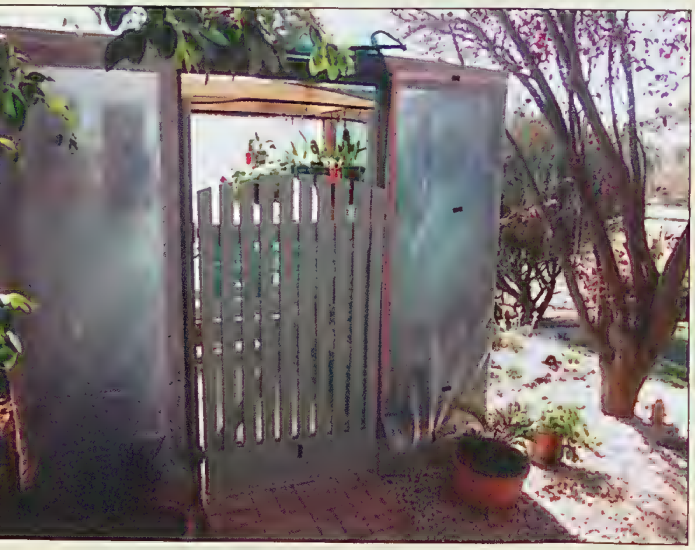
Shade-house Location

Given the very hot summers in the Riverina, the location of the shade-house was chosen to maximize light but minimize heat load in the hottest period of the year. The shade-house was located with a deciduous flowering *Prunus nigra* on the eastern side to reduce the summer morning heat load but allow plentiful sunlight from May onwards through autumn and winter as the tree loses its leaves relatively early.

The western side is protected from the hot westerly summer winds and afternoon sun by evergreen shrubs. These also reduce cold air drainage effects in winter as they are on the upper side of the slope.

Polycarbonate Roof

Many orchids like a dry winter rest period and the polycarbonate roof allows plants to be kept drier over the winter period when rainfall is highest. The roof material has a 40% shade factor that is adequate for all but the hottest four months of the year. This allows good light over winter when many orchids need higher light levels to promote flower initiation. The polycarbonate roofing material has the additional advantage of producing a more diffuse light than a similarly rated shade-cloth. The solid roof also greatly reduces the risk of frost damage in the colder months.



Shade-house consisting of treated pine frame with polycarbonate roof and shade cloth slides. The shade-house is wrapped in removable horticultural film secured with Velcro in cooler months with a door flap that can be folded back to prevent overheating. The deciduous tree on the eastern side shades in summer but allows the sun in during autumn winter.

An additional temporary layer of 70% shade-cloth is suspended over the top of the polycarbonate roof in summer to reduce heat gain and also further restrict light levels. It is removed in autumn as days become shorter and more light and warmth is required.

Shade-house Sides

The sides of the shade-house are covered with 40% shade-cloth. This allows good airflow in the warmer months. From May to August plastic horticultural grade sheeting is wrapped around the sides of the shade-house that largely seals it, although there are some small gaps for airflow. On a sunny autumn-winter day this raises the daytime temperature in the shade-house from around 12°C to 22°C. Night temperatures are little affected by the plastic but the duration of low temperatures each day is greatly reduced and providing there is sun, the shade-house warms up rapidly in the morning during autumn-winter with daytime temperatures consistently 8-12°C warmer inside the shade-house.

The bottom 30cm of the shade-house sides have a solid fc fibre-board sheeting. This was a later addition and had a surprisingly large beneficial effect on humidity, increasing it by about 10 percentage points in summer compared to when only the shade cloth alone went down to ground level.

Floor

The floor of the shade house has a central brick path to provide additional thermal storage mass in winter and a clean walking area. The area surrounding the path has a thick layer of gravel to retain moisture and increase humidity during the warmer months.

Watering and Humidity System

Hand watering is practiced where possible but an automatic watering system is also installed to allow some flexibility to travel (and to visit orchid shows). A central overhead spray system is set to drench the plants three times a week for about four minutes depending on the weather during the hottest months. The watering frequency and duration can be increased or decreased depending on ambient temperatures.

Base of shade-house is closed in with fibre-board to increase humidity.

A free draining potting mix containing 30% perlite is an essential part of the watering regime to ensure plants can cope with the relatively frequent watering.

In addition to the micro sprays, an overhead misting system is installed to provide increased humidity and to cool the air. I have found plants can tolerate higher summer temperatures for short periods providing humidity is increased. The misters come on automatically every hour for 15 seconds between 10am and 4pm every day in hot weather. The misters raise the ambient humidity from a value of around 20% in hot weather in mid-summer to around 40-45%. Although the effect is only transitory, it does have a noticeable cooling effect.

The mister system also has an under bench micro spray system connected to it that waters the gravel and path further raising the humidity. The above ground mister can be turned off with an inline tap located in the poly pipe and only the under bench sprays are used when daytime temperatures subside to avoid wetting the plant leaves unnecessarily and encouraging fungal diseases.

To further increase humidity around the plants, large shallow gravel filled trays containing water are placed on the benches and pots are stood on these in summer.

Heat Banks

Two 60 litre black poly crates under the benches are filled with water to act as a heat bank in the cooler months, absorbing heat during the day and releasing it in the evening.

Matching the Right Orchids to the Climate

Some care must be taken to select the more cold tolerant genotypes and hybrids within each of the orchid species, however it is still possible to grow many species well outside the accepted temperature and humidity ranges frequently quoted without resorting to a more sophisticated and expensive heating and cooling system.

My low tech, low cost shade-house allows me to grow a wide range of orchid genera and species including *Beallara, Odontoglossum, Oncidium, Odontocidium, Coelogyne, Cymbidium, Colmanara, Dendrobium, Degarmoara, Cattleya, Laelia, Laeliocattleya, Bletilla, Miltassia, Odontioda, Potinara, Miltonia, Wilsonara* and *Vuylstekeara*.

Local growers and those from more southern regions are good sources of cold tolerant species and genotypes. Publications such as *Growing Orchids in Cool Climates of Australia* and web articles by Brian Milligan, Ross Pascoe and the Santa Barbara Orchid Estate in the USA list orchids with proven cold tolerance, and are a valuable guide for selecting orchids suitable for growing in a protected shade-house in cooler inland areas.

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- *Cold Tolerant Orchids of the Cattleya Alliance* by Ross Pascoe
- OSCOV Website: www.oscov.asn.au
- Santa Barbara Orchid Estate website: www.sborchid.com ■

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Black plastic containers filled with water are placed under benches as a heat bank to store heat during the day and release it at night.

The automated watering system comprises a combination of overhead misters (foreground) and under bench sprays for cooling and raising the humidity and micro sprays (background) for watering.

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Essay Competition 2015 2nd Prize Winner

"How do you manage your Orchid Collection without relying on artificial heating and/or cooling?"

Cost Effective Temperature Control and the Diurnal Dilemma

by Richard Mollee

Flowering orchids can now be easily purchased at any time of the year, however, re-blooming these orchids is often significantly more challenging. Commercial growers commonly use artificial cooling to induce flowering in orchids outside of their typical blooming season. Such artificially controlled conditions are not usually available to most hobbyists, prohibited in large part due to high initial set up, and ongoing running costs. Fortunately, good culture is easily achievable without costly artificial heating or cooling if planned for appropriately. Most affordable temperature control techniques are centred upon the concept of insulation, slowing the absorption of heat to remain cooler, or minimising the loss of heat to remain warm. Each grower needs to determine which technique is best for their collection, as well as the scale that is necessary.

Few hobbyists are content to cultivate orchids considered 'easy to grow' in their locality. The majority of us have more typically assembled a mixed collection, including genera originating from vastly different climates, some of which have very different cultural requirements. Yet, despite providing the correct light, air flow, humidity, watering and fertiliser to these particular plants, their failure to thrive leads to the general consensus "you can't grow them here". The failure for growers to re-bloom otherwise healthy plants originally cultivated in a different region is often attributable to diurnal fluctuation.

Diurnal variation refers to the difference between night and daytime temperatures, and is believed to be crucial to induce flowering for a wide range of orchids. This factor is often overlooked when orchids are cultivated beyond their natural range. However, all is not lost, as even though the minimum-maximum temperatures may differ significantly throughout the year, the difference from month-month diurnal changes may not be as significant. Therefore, understanding the climate in an orchids' natural habitat can help us to better appreciate their temperature needs, and consequently, their expected flowering season. Furthermore, implementing cost-effective temperature control strategies can reward growers' efforts to re-bloom their orchids.

Cooling

Passive cooling can be achieved through the employment of a range of cost effective techniques that can be implemented on a short-term or even permanent basis. Additional shading is perhaps the first method of reducing temperatures inside the orchid house during the day. As a temporary measure, palm fronds or similar branches can be laid on the roof to help reduce temperatures and help avoid sunburn to your orchids. A more seasonal approach is to add another layer of shade cloth over the roof and western side of the orchid house. Such measures may not be suitable as an all-year-round solution, because winter light levels may be adversely affected, warranting the removal of any added summer shading. If a high diurnal change is required in the summer months, be careful not to implement too many daily temperature-reducing strategies, or you risk having only small diurnal differences.

Most orchids can withstand short-term extreme temperatures when coupled with high humidity, which helps to reduce stress from high rates of evapotranspiration. Consequently, damping down the floor of the orchid house, where the floors are sprayed with water, can help to maintain humid conditions. To this end, care must be taken when considering the flooring material. Fine gravel is often preferred for this purpose, and is long lasting. An additional damping down at dusk can help to increase the diurnal variation in the summer months. An alternative or additional measure to this is to fill some containers, such as buckets with ice or cool water. The high specific heat capacity of water will help to keep the orchid house cooler as significant heat energy can be absorbed before the temperature of the water rises significantly. Such containers can also help to maintain high levels of humidity, especially when coupled with good air movement.

Air movement is particularly important during times of high temperatures, as stagnant air will heat up faster than free-flowing air. To avoid this, ensure cross ventilation, whereby fresh air enters one end of the orchid house and moves through to exit at the opposite end, is operating effectively. You can always check your orchid house for its air movement by cutting up strips of plastic from a shopping bag and tying them at various locations. This is an easy way to observe air flow, as even the slightest breeze will move them. Any strips that remain still, will reveal pockets of potentially stagnant air, and help you to identify where to address improvements in the orchid house such as reducing overcrowding. Any containers of water will be best placed towards the end of air inflow so that the moving air passes over the water, providing an evaporative cooling effect.

Finally, the positioning of any heat-sensitive orchids should also be taken into consideration. The ground level can be several degrees cooler than higher up in the orchid house.

Exploiting these microhabitats, even seasonally in a mixed orchid collection, can be the difference between a growers success and failure to bloom their plants. Further modifications can be made at an individual plant level by taking steps to ensure the roots remain cool. If high temperatures are an issue, then growers should consider avoiding the use of black plastic pots. Black objects absorb heat significantly more than lighter colours indicating that pale coloured or clear pots would assist in minimising heat absorption in the orchid house. Better still would be the adoption of porous terracotta pots that can be saturated to reduce the temperature of the root zone and the orchid house. This acts to provide a degree of insulation, protecting the roots from heating up and drying out, whist simultaneously increasing the humidity around the plant. Even if the growing pot is placed inside a larger terracotta one, it is a technique that can also be applied at dusk to help to increase the diurnal variation to initiate flowering.

Heating

As the heat of summer passes into the autumn and winter months, many growers become concerned about the cold. As we are essentially dealing with the opposite problem of high temperatures, it makes sense to consider undertaking the reverse approach to the strategies outlined above, and employ a combination of heat absorption and insulation techniques. The most effective strategies will vary depending on individual locations, orchid house construction materials and orientation.

Regardless of the type of orchid house, winter is the time to maximise the amount of light entering it, within the tolerance limits of the orchids of course. This may mean removing additional shading that was needed to reduce the heat of summer. As the amount of daylight is reduced, there is less time for heat absorbing material to work. Additional material such as stone, brick, concrete blocks, containers of water and black pots can all be used to absorb heat energy during the day and release it slowly through the evening, warming the ambient temperature inside the orchid house. Maximising this heat absorption, should be coupled with effective heat loss minimisation techniques.

The opaque or transparent materials to insulate orchid houses have improved in quality considerably over the past decades. A range of more UV stable plastics and polycarbonate materials can be effectively used for longer periods outside than ever before. More and more growers now add plastic covers to their orchid houses, with the aim of keeping the internal air of the orchid house warmer for longer. A double layer is more than twice as effective as the trapped layer of air in-between remains fairly stable. An alternative to this is the installation of bubble-wrap type plastic. Less UV stable but more insulated than a single layer of plastic, it is worthwhile for growers to experiment in order to get maximum benefit for their efforts. A special note of caution is needed here as care must be taken not to limit air flow in the orchid house or to create an environment more suited to disease than to the growth of the plants. This may necessitate rolling up plastic sides or opening air vents or doors to allow fresh air in to the orchid house. Ideally this is done during warm periods or as observation and experience dictates.

A maximum-minimum thermometer is a great tool to help understand the variations of your growing conditions, and is recommended for novice and experienced grower alike. They will reveal if the diurnal variation is too small to initiate flowering, and help inform you of the effectiveness of any modified practices. If, however, all this seems like more trouble than it is worth for a handful of warmer growing orchids, then consider finding a suitable location inside the home for the cool winter months. Many orchids will be more than happy for a short time indoors if their basic needs are met, with their flowers lasting longer too.

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Essay Competition 2015 3rd Prize Winner

How do you manage your orchid collection without relying on artificial heating and/or cooling?

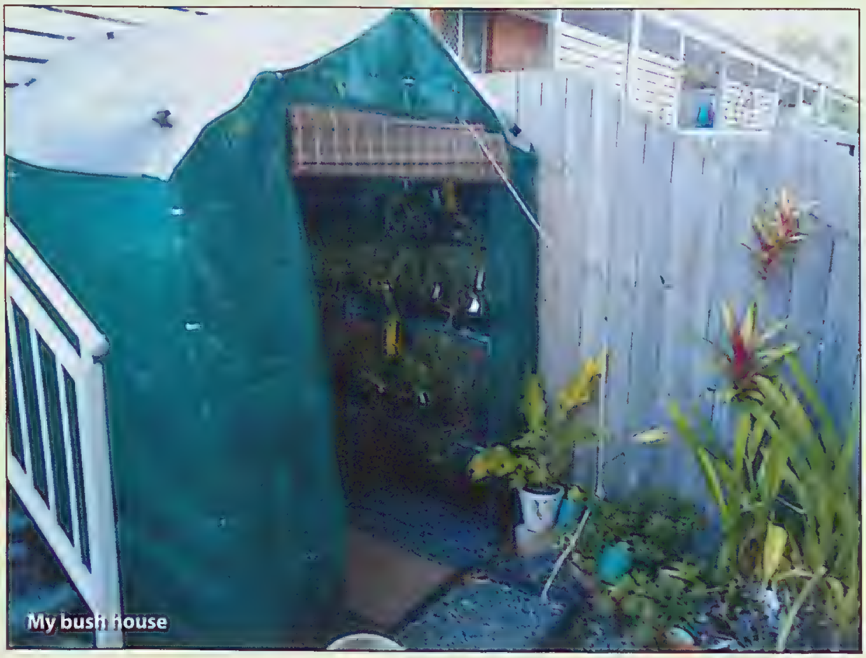
by Julie Copely-Bishop

Through being a member of orchid societies in South East Queensland for a number of years, I have had the pleasure of viewing the collections of many hobbyists. Many of these growers are known for their competition standard orchid blooms. Over time they have established their bush houses with cooling fans, heating systems and water walls as well as timed misting and watering systems and other quite sophisticated technology. At the other end of the spectrum are those who have set up microclimates in terraria and wardian cases suitable for the many miniature orchids now available to hobbyists in Australia. While these ideas are thought provoking, I would find the set-up, maintenance and running costs prohibitive.

As I live in South East Queensland with an overall great climate of warm to hot days and an adequate rainfall to suit many orchid species, I attempt to provide the best environment and care I can to manage my orchid collection. That said, it has not been without difficulties as I have to adapt to a lack of physical space in which to site my bush house. Secondly, in the past I have added to my collection without any rhyme or reason but just for the sheer pleasure of the process. I truly enjoy the whole orchid show experience. On reflection, I now think a significant influence on how I manage my orchid collection has been drawn from my father's experience of his orchid hobby. From the 1950s my father devoted his spare time to grow his beautiful blooms initially only with the aid of the sun, tap water and a very well-maintained basic fern house. This passion lasted throughout his lifetime.

I work within and accept, most of time, the environmental conditions that I have to grow and flower my orchids within practical parameters, but without diminishing the pleasure I derive from my rewarding hobby. I see the miniatures as especially advantageous because my physical space is extremely limited. The rewards are seeing the little brown flower from my cork mounted *Epigeneium nakaharae* with its "look at me" expression - just exquisite. The Orchidaceae offers such a wide variety of orchid flowering habits to suit specific conditions to hold the interest of a hobbyist such as myself. But I still regularly over-reach my orchid growing knowledge, ability and better judgement so it has been an exceptionally slow and expensive learning curve to bring a distinct focus to my collection. Even now I can be side tracked by a showy and fragrant *Cattleya* on a trade table. Other unsuitable impulse buys I generally have to move on to friends and family as I do not have their appropriate growing conditions or the space in which to accommodate them. I live in a senior's unit that has a small front veranda and an equally small back courtyard.

I grow my collection within the natural conditions that I have without relying on creating an artificially heated or cooled environment. Having only a small back courtyard, I use the only part not concreted to site my tiny, tiny bush house. The house is actually two smaller greenhouses from a local hardware chain of the "assemble yourself" variety now cobbled together with cable ties, hockey straps and covered with 70% shade cloth (not the provided plastic covers) to hold it all altogether. The structure is wedged in between the



My bush house

step hand railing and a two metre wooden fence of the next unit, not ideal but the chances of it taking off in a storm like something out of *The Wizard of Oz* is pretty slim. I replaced the chip bark on the floor with drainage gravel so I can water in the warmer months to encourage humidity. This has the added advantage that the resident toads are discouraged from setting up camp underneath. Creepy when the chip floor moved.

As the front part of the bush house sees the sun earliest in the day I house a few *Coelogyne* such as *Coelogyne viscosa, Coelogyne pandurata* and *Coelogyne tomentosa* (syn. *Coelogyne massangeana*) and others that flower well and a few remaining larger Bulbophyllums such as *Bulbophyllum* Wilmar Galaxy Star (what was I thinking?). My focus now is growing the smaller hanging Bulbophyllums such as *Bulbophyllum alagense* and *Bulbophyllum tingabarinum*. I am persisting, with limited success, in growing and flowering Lycastes such as *Lycaste campbellii, Lycaste bradeorum* and *Lycaste macrophylla* (still unflowered). These are housed on flat benches on either side of the entrance. Hanging from the ceiling at the rear of the bush house, the last part to receive the sun in the day for the longest time, are a number of mesh sheets from which I suspend my growing collection of miniature mounted orchids. The bare rooted varieties such as the *Chiloschista viridiflora*, despite being basically a mass of fleshy roots, appear to be doing well (they survived the last winter). They have the most delightful pale yellow flowers on a long stem as the reward for patience and attention. I find that they still need to be misted daily throughout winter as many are mounted on cork so they do not retain moisture.

Through the colder months I rely on the sun to warm my orchids. To aid this I wind up the front bamboo curtain that serves as a door for about half the day to prevent the air inside becoming stagnant. I also have laid a clear plastic sheet on the roof for the next couple of months to counter frosts. This sheet appears to have a warming effect in the house generally. When I fertilize I use warm water. Living in Logan the temperature can go down to 6°C or lower so I do not mist spray till the warmth of the day has spread through most of the house, which is well after midday. I know this goes against the accepted norm of watering earlier in the day in winter for the foliage to dry out before nightfall but this works fine for me. Being not totally bug proof around the base of the structure also aids air flow. The only miniature orchids that I have lost in these conditions are those that were really too young to cope and thrive in these conditions. These impulse buys are generally the ones that you really should walk away from at an Orchid Fair.

The other side of the courtyard is also devoted to my collection. This area is covered by 70% shade cloth where the majority of the plants are hung from the fold away clothesline such as a favourite *Trichoglottis atropurpurea* with its flowers of rich red colour with a white and purple lip. Another of this genus I have here is *Trichoglottis loheriana* now known as *Staurochilus loherianus*. Among the other hanging orchids is the miniature *Ascocentrum christensonianum* as well as a *Pelatantheria insectifera*, another favourite with its clusters of greenish flowers, with reddish brown stripes on the petals and sepals. The lip is white and fuchsia, quite striking. My bare rooted Vandas are also homed here. Their healthy green tipped roots indicate that they are happy in this position as are the *Trichoglottis*. There are also two metal stands of mainly mini-cattleyas and a few spur of the moment totally unsuitable buys such as a *Thunia marshalliana* commonly known as the "bamboo orchid", which I still hope will flower in my back courtyard. If it flowers it will indeed be the triumph of hope over experience.

The loss of the clothesline was not a burden as it was designed by someone who has never hung a load of wash out. The lines are strung very close together and the fold down line is positioned on the wrong side of the court yard to be of any use. The rear of the six seniors units is also backed by a two metre fence and one large tree directly behind me. Despite my orchids being homed in such an enclosed area as they are between two two-metre fences and a privacy screen, the air flow is still sufficient as long as I keep all the pots with significant space around them. It is a truism not to let your plants be crowded as you will end up spending so much time removing mealy bug etc. Although not as small a collection as it will eventually be, it allows for several daily visits to check on any little fly-in leaf and bud munchers as the bush house and the partially covered courtyard area are not bug-proof. The bane of my life is the hunt for garlic snails (slicing up potatoes and out with a torch after dark), random slugs and mealy bug. To aid humidity, I keep the concrete floor well hosed throughout the day as well as regularly mist spraying the bare-rooted varieties.

The other space I share with my orchids is the front veranda of my unit, which has the advantage of receiving the morning sun and adequate light. While partially covered by an awning the veranda is open to the elements. My Vandas were initially hung from long green hooks off the front veranda gutters. This proved to be unsuccessful and they now reside in the back courtyard. Anything in bud is moved

My covered courtyard area

here for me to keep an eye on while I have my morning coffee. Sharing the table is a number of *Doritis*, not competition quality, but great bloomers and totally enjoyable for their range of colours from the delicate to the vibrant. The veranda is basically a retirement village for the shy bloomers of my collection such as a number of Bifrenarias, a *Eulophia guineensis* and three Catasetums and the remainder of my larger *Cattleya* collection that are resistant to flowering but for which I still have hope. Again, I regularly water the concrete floor in the warmer months from a small 100 litre water tank on a stand in the back corner of the veranda to aid humidity as there is no front tap. I mist spray my orchids from a wheeled 9 litre water carrier.

In hindsight, I think a significant influence on how I manage my orchid collection and not to get caught up with the mechanics of it has been drawn from reflecting on my father's experience of his orchid hobby. I have absolutely no idea of why, when and how my father started his collection or where he purchased his supplies. I only have a child's memory that is clouded and distorted by time of what I remember as a really large bush house built in the back corner of our suburban backyard. It was constructed from tree trunks cut and dragged from nearby bushland at Clifton Hill/ Moorooka, Brisbane and covered by chicken wire. To provide mottled shade he interlaced fir branches along the sides with the larger fir branches being thrown on the flat top. I think in later years these were replaced with the yellow corrugated plastic sheeting so popular at that time. I remember dirt floor walkways with masses of delicate maiden hair fern growing underneath the wooden slat benches. His only watering system was a hand held hose and the only heating system, the sun. Without all the benefits of cooling fans and heating systems he still managed to grow exceptionally beautiful *Cymbidium* and Slipper orchids. I have childhood memories of his huge pots of cymbidiums being brought into our family home for reverent display. But I am sure that he would be amazed and delighted at the varieties now available to hobbyist orchid growers. Unfortunately before his passing his orchid collection had become unmanageable due to its size and his ill health and many fine specimens were lost.

Observation of the physical environment in which my orchids inhabit I believe is the key to the management of my orchid collection: to be flexible as to where I place certain species if the sun direction or its intensity changes throughout the year. Past experience has also shown I need to keep my collection within certain constraints especially as to numbers and to what species I can successfully grow and flower. Without having to rely on artificial cooling and heating technologies I also find hand watering the plants allows me the time to see if they are flourishing and to keep an eye on pest control. While I do understand the practicalities and necessity of having an enhanced or alternate environment if you are going to grow and flower blooms in quantity not indigenous to this climate, but it is not for me. The bonus in writing this essay has also been in revisiting my father's photographic slide collection enabling myself and my eldest daughter to share his love of orchids.

Julie Copley-Bishop
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Email: j.copley-bishop@griffith.edu.au

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- The essay is to be in English and typewritten
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- The authors of the essays will remain undisclosed to the judges, whose decision will be final. If in the opinion of the judges, no worthy essays are received, there will be no award that year
- Non-winning entries will be returned to the sender if requested. These entries may be submitted to the editors of Australian orchid periodicals for publication, with permission from the author
- The winning essay will be announced at the AGM of the Foundation in October 2016
- The winning entry will be published on the AOF website and in Australian orchid periodicals

Orchid Road Test

by Sam Cowie

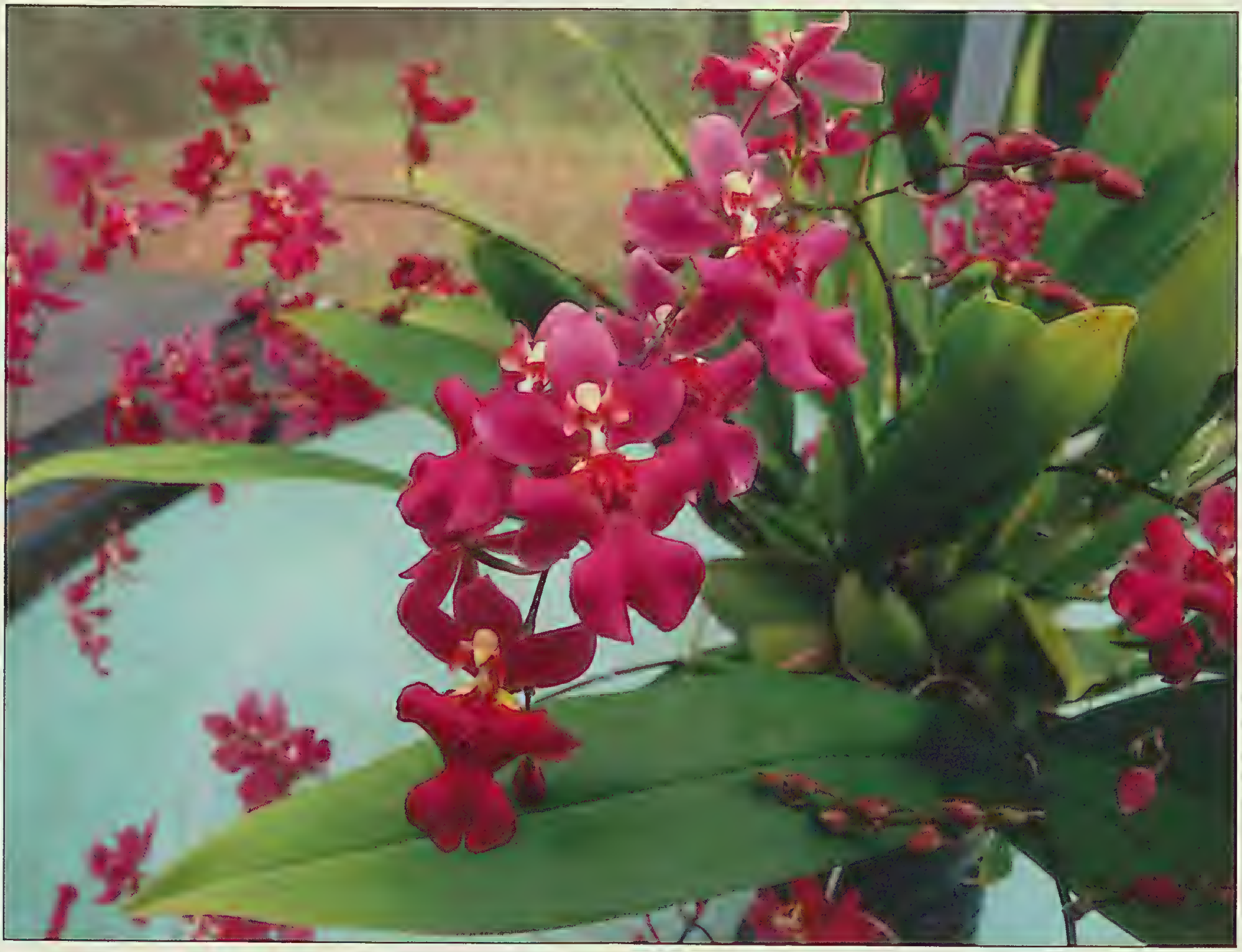
Bapticidium Possum Woolf

Previously in Orchid Road Test we've looked at mericlones, well it's time to look at a seedling batch where the variation amongst the seedlings may be huge or quite different from one seedling to the next. The seedlings that we're looking at today are from an Australian breeder, David Woolf from Woolf Orchidculture at Toowoomba Queensland. Several years ago David produced seedlings from the cross of *Baptistonia echinata* (pod parent) and *Oncidium* Twinkle (pollen parent). Woolf Orchidculture sold flasks of seedlings and tubes of deflasked seedlings, of which I was lucky to secure a nice selection. This Road Test is based on my experiences with the seedlings that I grew out, so your experience may not be the same.

Baptistonia echinata is a warm growing orchid that produces beautiful pendulous displays of tiny bee-like flowers with no real set flowering period that I've seen from my specimens. One of David's cultivars 'Carolyn' won both an AM and ACM from the AOC. A stunning plant that won the awards with a total flower count of 757 on just four inflorescences! Another cultivar of David's, 'Swarming Bees', has an AM/AOC with 501 flowers on just two inflorescences. I actually feel sorry for the poor judge that had to count those flowers!

Oncidium Twinkle is a miniature growing *Oncidium* produced from *Oncidium cheirophorum* (pod parent) and the pink *Oncidium sotoanum* as the pollen donor. It is a commonly grown and very popular miniature *Oncidium* in Australia and flowers from late May through to August. Now one problem with *Oncidium* Twinkle is the lack of heat tolerance due to the cool-growing *Oncidium cheirophorum* parent, so that on hot summer days over 35° Celsius this plant may suffer if not given sufficient shading, ventilation and irrigation.

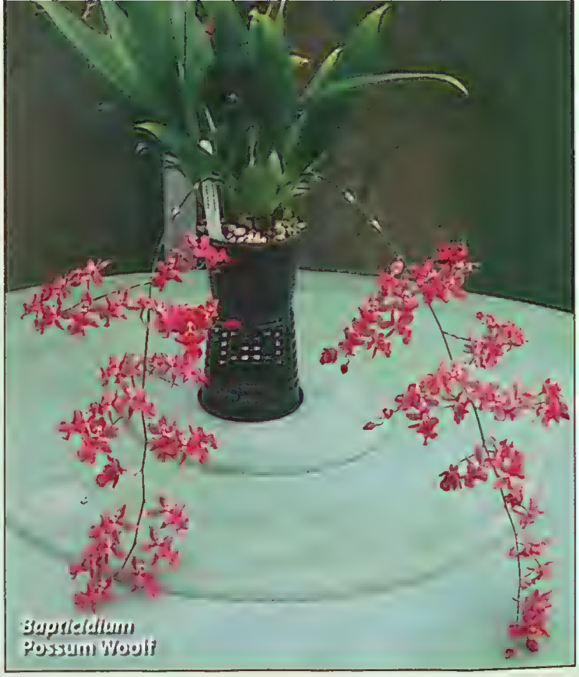
Now the beauty of David's cross is the introduction of the warm to hot growing *Baptistonia echinata* into the miniature type *Oncidium*. Now I think he achieved this goal with the seedlings, as over the last two years of growing them we have experienced some of the hottest weather in Southeast

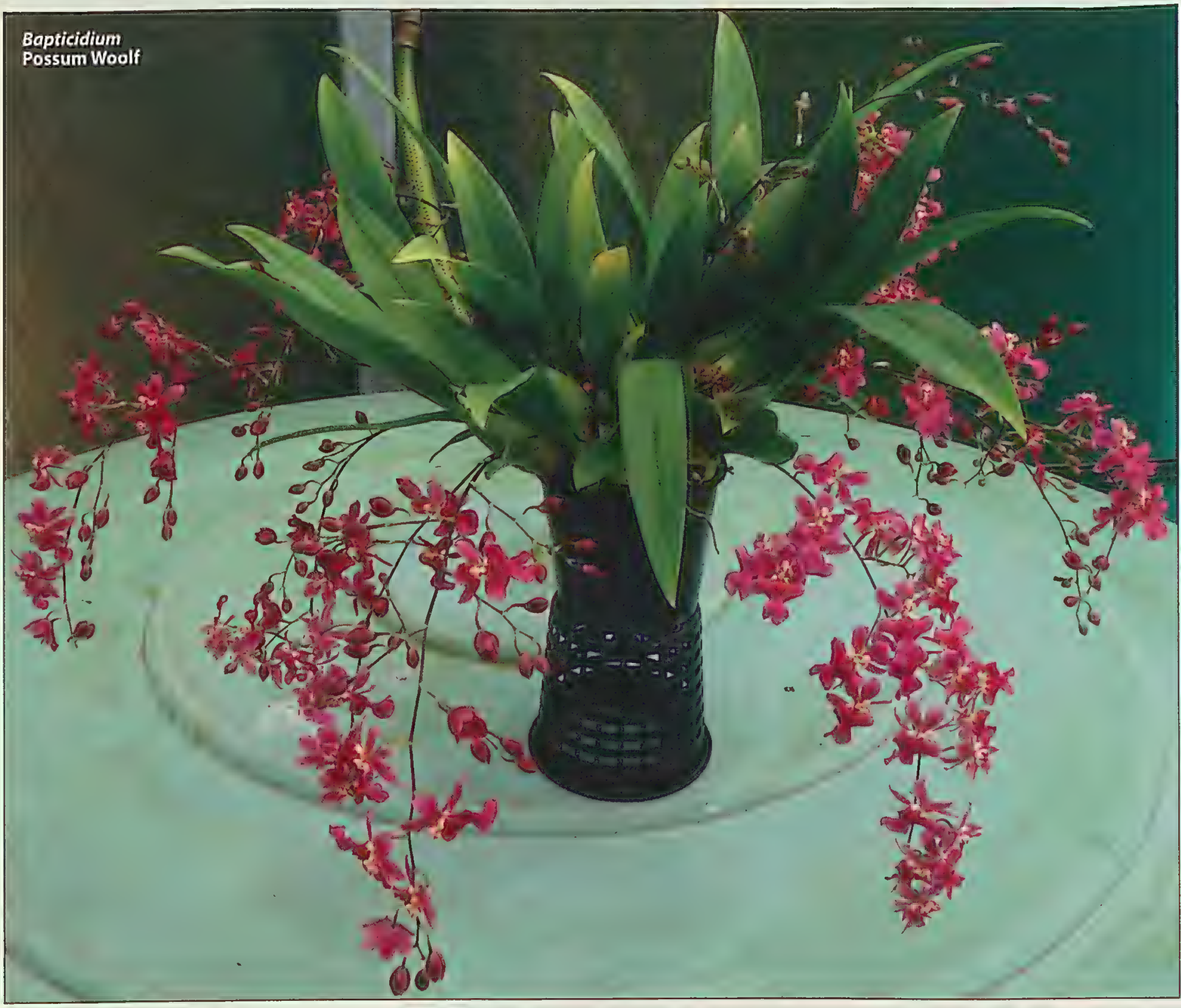


Queensland and the greenhouse they were in topped 42° Celsius without any heat damage to the seedlings. I was hoping the cross would produce miniature *Oncidium* orchids that didn't have the restricted flowering season of Twinkle, well they almost did that. Our selection produced seedlings that flower at least 6 to 8 weeks earlier than your normal Twinkle in Southeast Queensland and were still producing flowering specimens into late June, so an improvement on Twinkle.

One of the great things about *Oncidium* Twinkle-is that mature specimens will produce 4 spikes per growth, but alas the selection of *Bapticidium* Possum Woolf seedlings is yet to produce any more than 2 spikes per growth. We did have a few seedlings only produce 1 spike per growth so they went into the compost. What *Bapticidium* Possum Woolf seedlings make up with is that prolific bulb production from Twinkle, so after 2 years you will have a very full and fluffy plant in an 80mm pot. This prolific bulb production combined with 2 spikes per bulb gives you a very nice flowering display, as maybe seen in the photos.

The seedlings that I acquired came from David's cross that used a red Twinkle parent, so all the seedlings so far have produced red to pink flowers. David has done *Bapticidium* Possum Woolf using a yellow Twinkle and that has produced yellow flowers with red lips. All of the seedlings have flowered with far larger flowers than Twinkle,


Bapticidium Possum Woolf

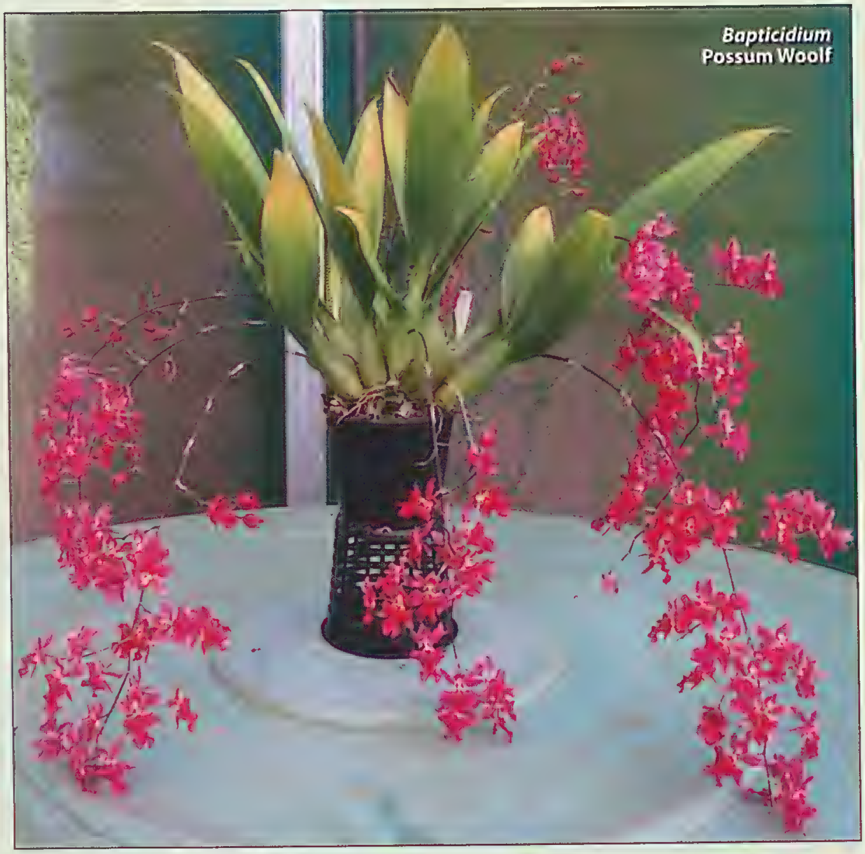

Bapticidium Possum Woolf

which are easily double or triple the size of the typical Twinkle flower. Most have opened in the red spectrum and then faded down towards the pink spectrum, although a few seedlings have opened in the pink spectrum. Honestly the variation between the seedlings isn't that great when it comes to flower size and colour.

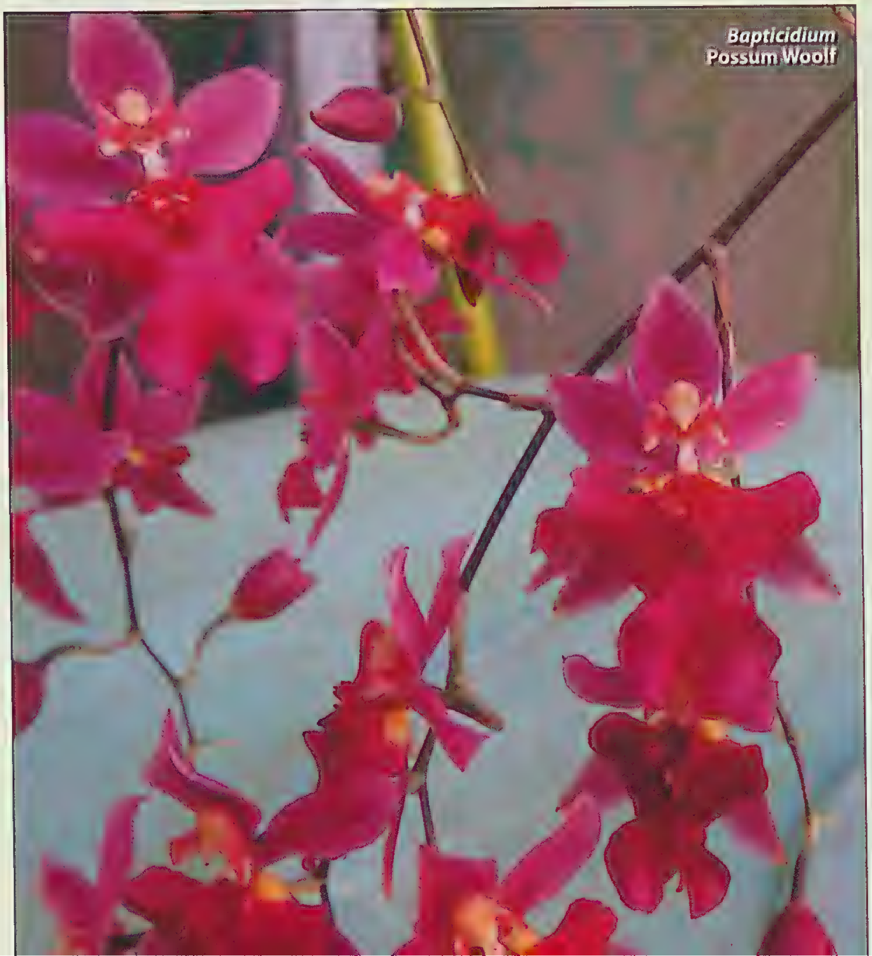
One problem with *Baptistonia echinata* is the pendulous flower spikes that require specimens to be grown in hanging baskets or hung up when the spikes start developing. A few seedlings of *Bapticidium* Possum Woolf have produced semi-pendulous inflorescences (as you can see in the photos), but the better forms have spikes out like a typical Twinkle. So quite small plants may produce a nice large rosette of flowering stems.

So *Bapticidium* Possum Woolf seedlings are easy to grow, tolerant of a wide range of climatic conditions, tend to be flowering over an extended season and don't take up much room in the greenhouse. Overall I would say this cross has produced some great miniature *Oncidium* orchids that would fit into anyone's collection.

Sam Cowie
Kin Kin, Qld



***Bapticidium* Possum Woolf**



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Two new species of *Eriochilus* (Orchidaceae: Caladeniinae) from South Australia

by David L. Jones and Robert J. Bates

Abstract

Eriochilus collinus and *Eriochilus paludosus* are here described as new. Both species are illustrated and notes are included on their distribution, ecology and conservation status; their distinguishing features are compared with those of allied taxa.

Key Words

Orchidaceae, *Eriochilus collinus*, *Eriochilus paludosus*, new species, South Australia, Australian flora.

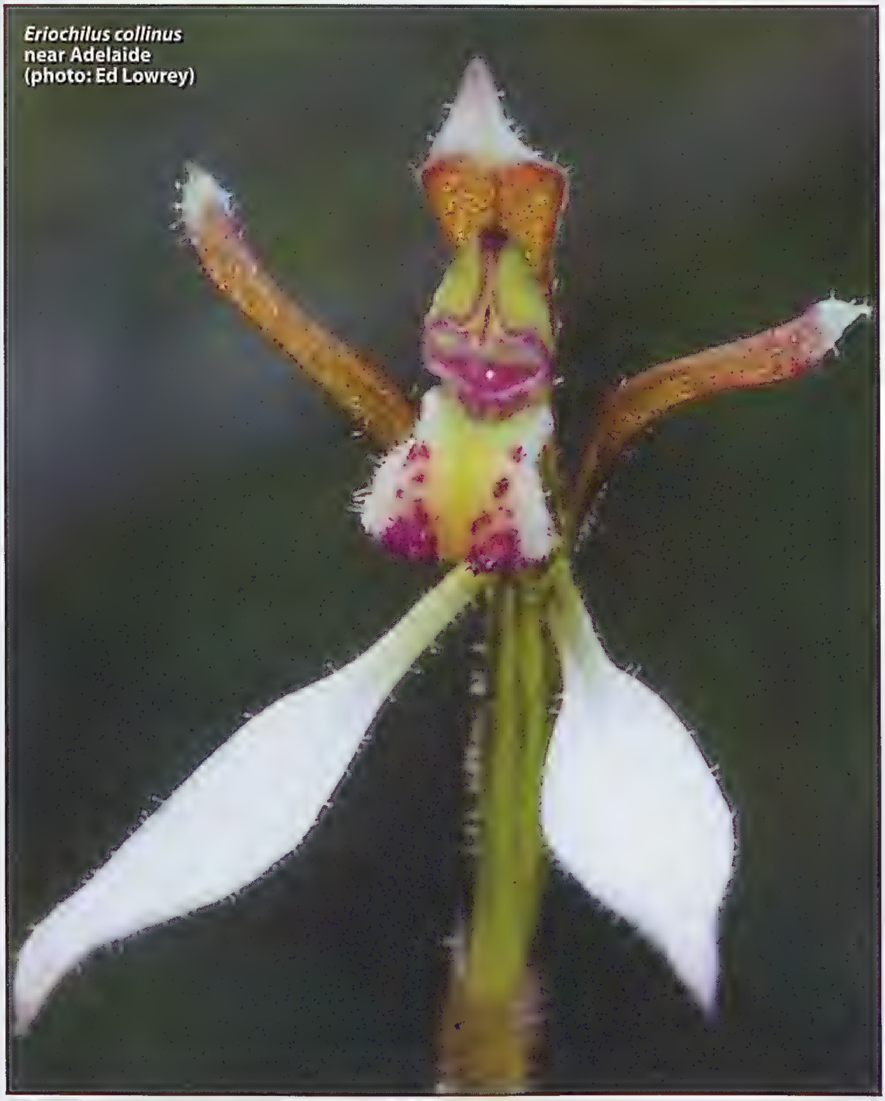
Introduction

The genus *Eriochilus* R.Br. is unusual among Australian orchids in that vegetative features are usually more important than floral features in identifying species, and this is certainly true of the South Australian taxa.

Although there are a dozen or so taxa in Australia only a single named species has previously been recorded for South Australia namely *Eriochilus cucullatus* (Labill.) Rchb.f (rarely referred to as *Eriochilus autumnalis* R.Br.). Recent authors in South Australia such as Bates (2008-2014) treat at least three South Australian taxa under tag names and this paper validates two of these.

Materials and Methods

The descriptions and illustrations of the new species were made from fresh specimens. Both species have been studied in the field (principally by R. Bates) and collections of each were compared to related species. Types relevant to this study (or photographs thereof), and collections cited, have been seen by us. Images were taken of both species in the field between 1985 and 2015.

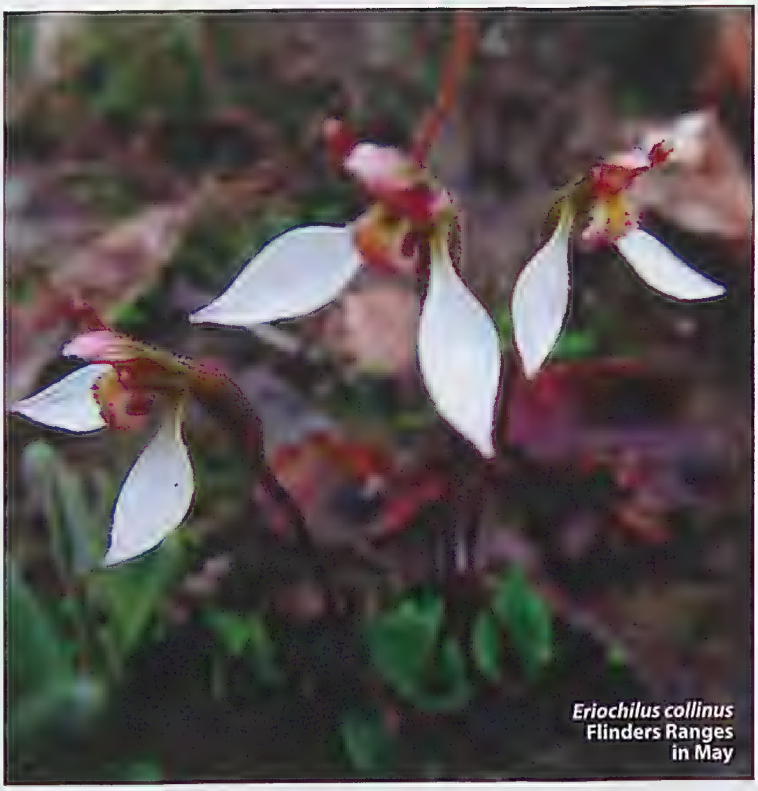

***Eriochilus collinus* near Adelaide (photo: Ed Lowrey)**

Taxonomy

1. *Eriochilus collinus* D.L.Jones & R.J.Bates ***sp. nov.*** With affinity to *Eriochilus cucullatus* (Labill.) Rchb.f. but differing by its cordate fleshy leaf which is dark green above and shiny deep purple or maroon beneath, with bristles and corrugations or ridges on the upper surface (the shiny, thinner-textured, smooth, ovate leaf of *Eriochilus cucullatus* is mid-green to pale green on both surfaces); the new species also has more colour in the flowers due to red or red-brown patches in the petals.

Type: South Australia. Nuriootpa Woodlands in Barossa Valley, 16 April 2001, *R.J.Bates 56092* (holo CANB 674484).

Illustrations: Bates & Weber 1990, plates 109 & 110 as *Eriochilus cucullatus*; Bates Orchids of South Australia electronic versions 2008-2014, as *Eriochilus* sp. Hills or *E.* sp. Hills woodland.



Eriochilus collinus
Flinders Ranges
in May

Description: *Leaf* undeveloped at anthesis, often not fully expanded until after seed-shedding, ground-hugging, prostrate, cordate, 15-40 mm long, 10-20 mm wide, the upper surface dark green with longitudinal ridges adorned with short bristles,. the underside purplish or maroon, smooth, polished. *Scape* filiform, 7-22 cm tall, red or green, adorned with numerous erect to porrect glandular hairs, 1-2-(3)-flowered. Fertile bracts closely sheathing, ovate, 1-3 mm long, 1-2 mm wide, purplish to yellowish green, sparsely hairy, subacute to truncate. *Ovaries* subcylindric, 8-12 mm long, 1-2 mm wide, green with prominent red ribs. *Flowers* 7-10 mm across, white, often with pink tinges or pink lines. *Dorsal sepal* suberect, cucullate, spathulate, 7-9 mm long, 2.5-3 mm wide, greenish white above, red-brown below, with a white upturned or recurved triangular apex, margins recurved, with numerous short bristle-like hairs. *Lateral sepals* deflexed, divergent, asymmetrically ovate-elliptical, 12-18 mm long, 2.5-4 mm wide, white, often with a thin central pink line on the underside, tapered to a thin basal stalk c. 2.5 mm long; margins with numerous short bristle-like hairs. *Petals* obliquely erect, linear with a dilated apical portion, often shallowly sinuous, 7-9 mm long, c. 1 mm wide, red to red-brown with a white tip, glossy, margins recurved, with numerous short bristle-like hairs, apex obtuse or acute. *Labellum* erect in the proximal half then strongly recurved, obscurely three-lobed, with a varicoloured elliptical lamina and an oblong-tapered basal limb; limb closely adherent to the column, 3.5-4 mm long, c. 2 mm wide, greenish yellow with a smooth central groove, the margins incurved and extending distally as narrow wing-like lateral lobes; lamina c. 3.5 mm long, c. 3 mm wide, thick, fleshy, yellowish green, covered with clusters of coarse projecting red or purple trichomes; margins recurved; apex obtuse. *Column* projecting at an angle to the ovary, 6-6.5 mm long, c. 2 mm wide, yellowish green with red markings, a patch of short trichomes on the anterior surface. *Anther* c. 1.2 mm long, c. 1.5 mm wide, verrucose, pinkish to red. *Pollinia* eight, lamellate, orange. *Stigma* quadrate, c. 1.6 mm across, deeply saccate. **Fig. 1.**

Distribution and ecology: Restricted to heathy or grassy woodland in the higher rainfall regions of the Mt Lofty Ranges and Southern Flinders Ranges in south and central South Australia, extending as far south as Kangaroo Island and north to Mount Remarkable. Soils include gravelly clay, sand, loams and shallow soil around exposed rocks which provide extra water run off. Plants of this species occur singly or in small groups and are often concentrated on or around low cushions of dwarf sedges such as *Schoenus breviculmus*.

Flowering period: April to June, often after substantial rain.

Recognition: The new species is characterised by its cordate leaves which have strongly contrasting upper and lower surfaces; the dark green upper surface is prominently ridged and bristly, whereas the lower surface is dark red and smooth. By comparison the ovate pale green to mid-green green leaf of *Eriochilus cucullatus* is smooth and similarly coloured on both surfaces (although paler and shinier on the underside). Additionally the leaf of *Eriochilus collinus* is thicker and fleshier than the thin-textured leaf of *Eriochilus cucullatus* and often grows larger. Identification of the species from flowers can be more problematical although the colourful petals are a significant feature (distribution is also a useful guide - plants in the lower South-east of South Australia will be mostly *Eriochilus cucullatus*); plants growing in peaty bogs will be *Eriochilus paludosus* (see below).

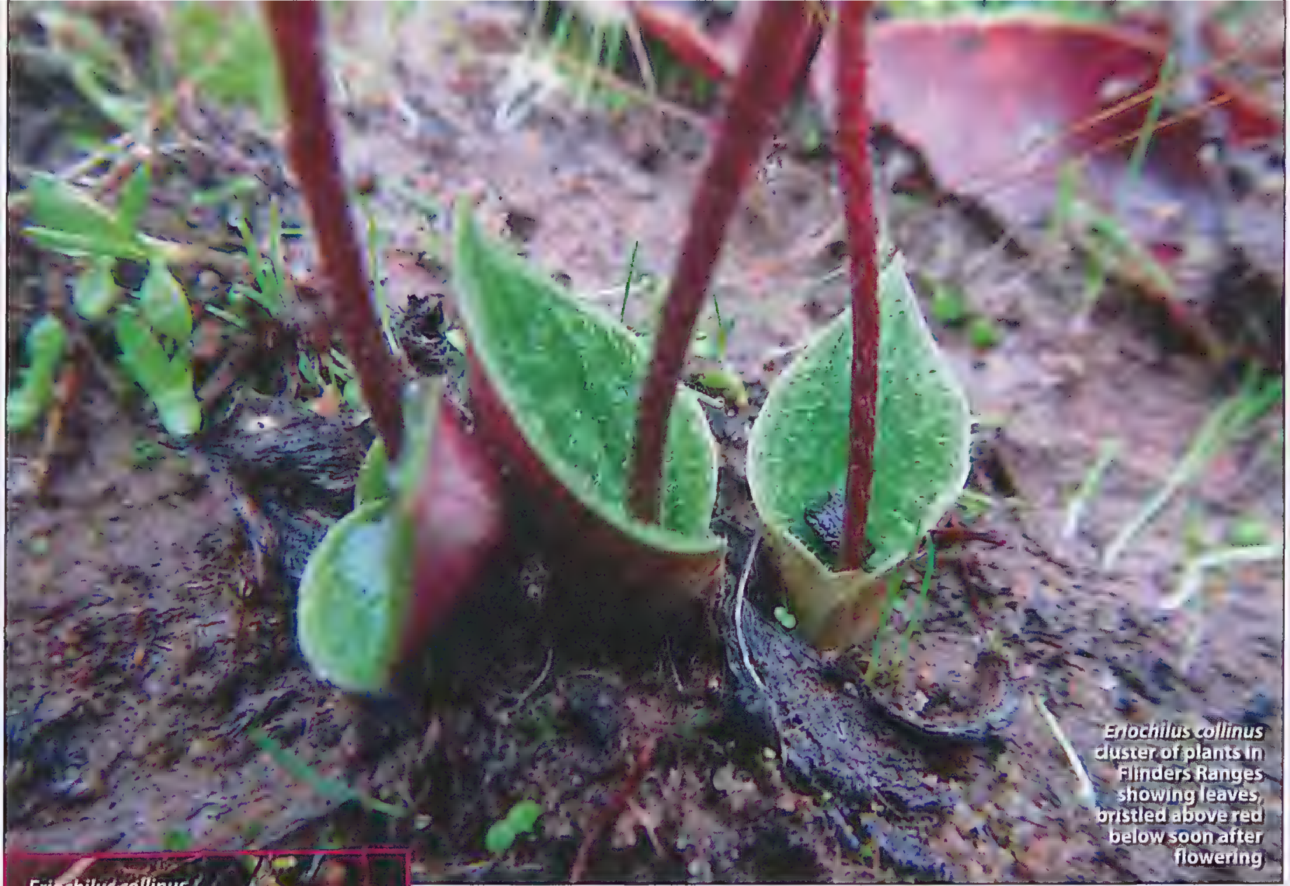
Growth features: The scape is leafless when it emerges from the (often hard) soil, although with early rain the leaves may appear as soon as the first flower opens. The scape elongates as flowering progresses but leaf development is slow to follow and the leaf may not reach full size until late winter or spring. The new species is outcrossing, pollinated by small native bees. Capsules develop rapidly dehiscing four to six weeks from anthesis after which the scape shrivels.

Variation: The variant that occurs on Kangaroo Island is smaller in all its parts with a less bristly leaf but is not afforded any taxonomic status here. Another variant with colourful flowers that grows on fertile grassy woodland is rapidly heading for extinction.

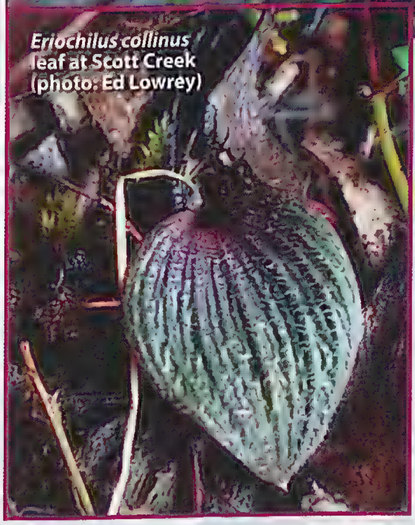
Conservation status: Locally common and well conserved in National Parks and reserves. The rough scrubby hilly habitat where it grows also affords protection from agricultural pursuits.

Etymology: from the Latin *collinus*, pertaining to hills, in reference to the hilly country which seems to be its preferred habitat.

Selected collections (most at AD): Southern Lofty Region: Cherry Gardens Switching Station, 22 May 1971, *J.Z. Weber 2028*; Cox Scrub Cons. Pk, 3 May 1986, *D.E. Murfet s.n.* (AD 98630031); Deep Creek Cons. Pk, June 1990, *R.Bates 23153*; Forest Range, April 1981, *A.G. Spooner 7701*; Hardy's Scrub, Onkaparinga Cons. Pk, August 1993, (mature leaves), *R.Bates 33742*; Kuitpo Forest, 3 May 1986, *R.Bates 7245*; Lirabenda NS Reserve, Leslie Creek, Mylor, June 5th 1986, *A.G. Spooner 10210*; Montarra, 14 April 1947, *A.W.Bell 234*; Scott Creek, April 1911, *E.H.Ising s.n.*; Upper Sturt, 25 April 1915, *E.H.Ising s.n.* (AD 96606961); Northern Lofty and Flinders Ranges Regions: 3 km west of Clare, 22 April 1988, *R.Bates s.n.* (AD 98821); Spring Gully Cons. Pk, far NW corner, 30 April 2000, *R.Bates 56369*; Mount Remarkable, 3 April 1976, *R.Bates 482*; Kangaroo Island, Kingscote, 26 April 1965, *G.Jackson* (Ida) 422; Barratts Corner, on American River to Kingscote road, 14 April 2000, *R.Bates 56473*; Northern Lofty, Emu Flat Nature Reserve, Clare, 27 Aug. 2000 (fruit), *R.Bates 57264* (CANB 621060).



Eriochilus collinus cluster of plants in Flinders Ranges showing leaves, bristled above red below soon after flowering



Eriochilus collinus leaf at Scott Creek (photo: Ed Lowrey)

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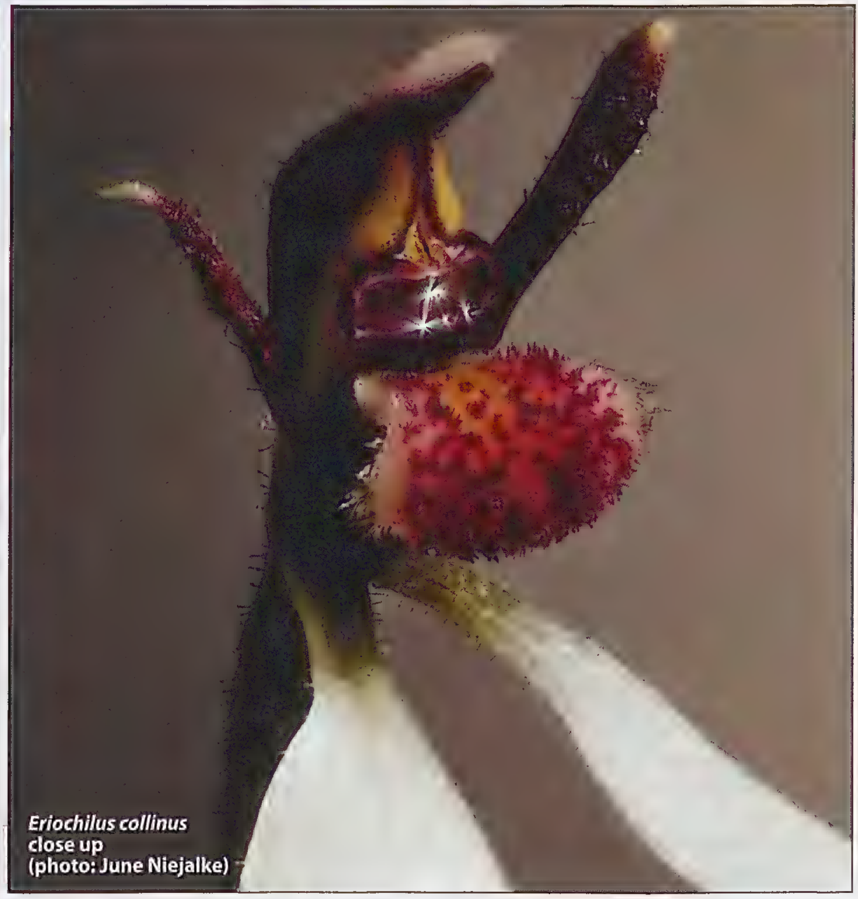
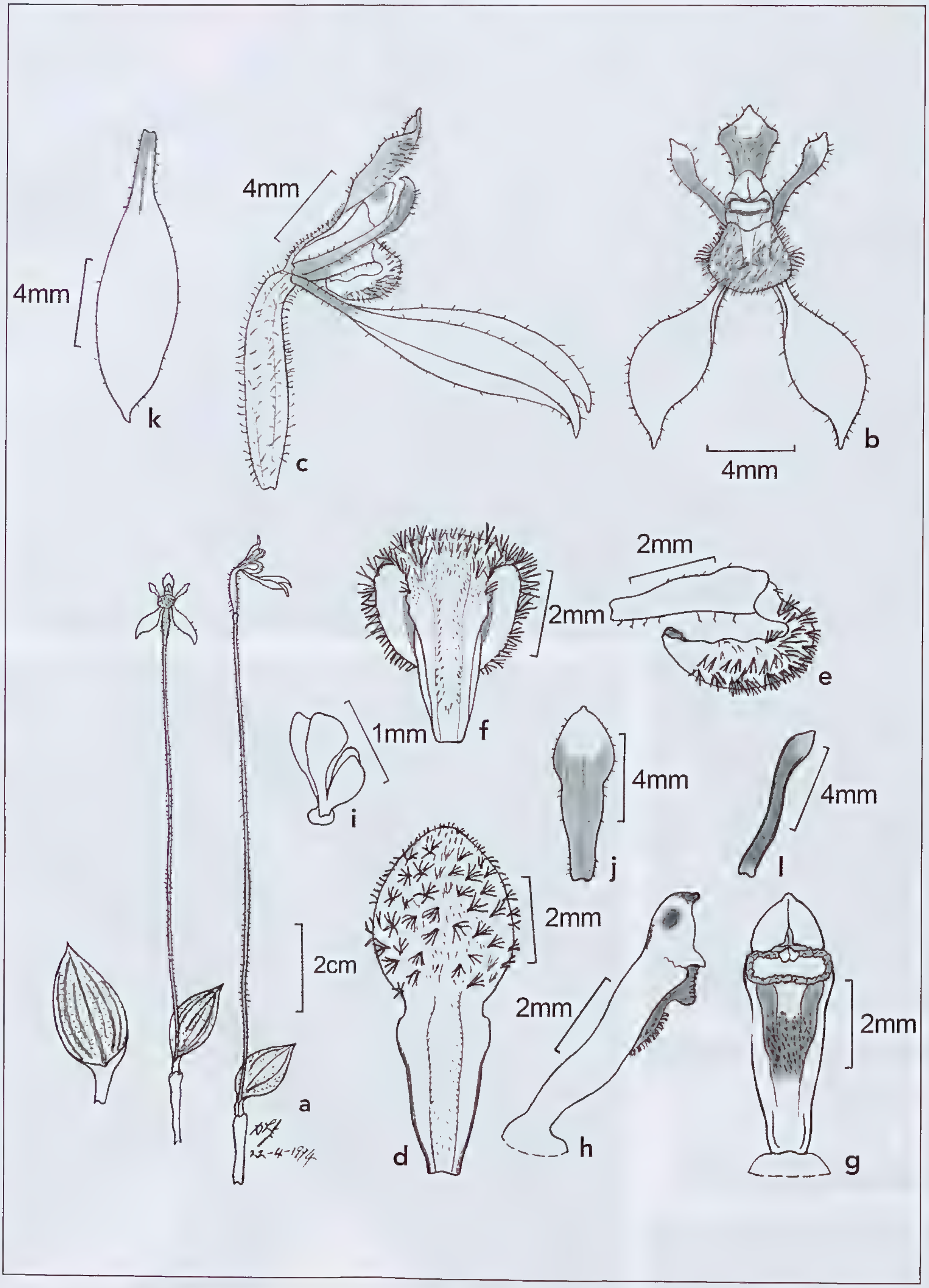


Eriochilus collinus close up (photo: June Niejalke)



***Eriochilus collinus*, Talisker Conservation Park, SA, *D.E.Murfet 1497*.**
a. flowering plants and separate leaf; b. flower from front; c. flower from side; d. labellum from above, flattened out; e. labellum from side; f. labellum from rear; g. column from front; h. column from side; i. hemipollinariun; j. dorsal sepal; k. lateral sepal; l. petal
© D.L.Jones, drawn 22 April 1994. (**Figure 1.**)

2. *Eriochilus paludosus* D.L.Jones & R.J.Bates ***sp. nov.*** With affinity to *Eriochilus cucullatus* (Labill.) Rchb.f but differing by its smaller ovate leaf with raised longitudinal veins and thin ridged midrib, and glabrous shiny brown scape. By contrast *Eriochilus cucullatus* has a larger lanceolate leaf that is smooth on the upper surface and green hairy scape.

Type: South Australia. Southern Lofty Dist: swamp approx. 5 km east of Myponga, 13 March 1994, *D.E.Murfet 1950a, R.Bates, et. al.* (holo CANB 619947).

Illustrations: Bates *Orchids of South Australia* electronic versions 2008-2014 as *Eriochilus* sp. Swamp DEMurfet 19506 (Swamp bunnies).

Description: *Leaf* developing before, during or after anthesis, ground-hugging, prostrate, ovate, 7-20 mm long, 5-15 mm wide, glabrous, the upper surface mid green with raised longitudinal veins and a thin, ridged midrib, the underside pale green. *Scape* filiform, 8-20 cm tall, pale brown or green, glabrous, shiny, 1-(-2)-flowered. *Fertile bracts* closely sheathing, ovate, 1-3 mm long, 1-2 mm wide, pink to pale greenish-white, glabrous, subacute to truncate or retuse. *Ovaries* subcylindric, 7-10 mm long, 1-2 mm wide, pale green, glabrous. *Flowers* 7-10 mm across, white, sometimes with pink tinges. *Dorsal sepal* suberect, cucullate, spathulate, 7-9 mm long, 2.5-3 mm wide, white above, red-brown below, with a white upturned triangular apex, margins recurved, adorned with few short glandular hairs. *Lateral sepals* deflexed, divergent or nearly parallel, asymmetrically lanceolate to linear-lanceolate, 10-13 mm long, 2.5-3 mm wide, shiny, white or pink, tapered to a thin basal stalk c. 3 mm long; margins with a few short bristle-like hairs. *Petals* spreading to obliquely erect, linear, falcate to shallowly sinuous, 5-8 mm long, c. 1 mm wide, dark red-brown with a white tip, margins recurved, glabrous, apex obtuse or subacute. *Labellum* erect in the proximal half then strongly recurved, very obscurely three-lobed, with a varicoloured elliptical lamina and an oblong-tapered basal limb; limb closely adherent to the column, 3.5-4 mm long, c. 1.6 mm wide, greenish with a smooth central groove, the margins incurved and extending distally as narrow whitish wing-like lateral lobes; lamina c. 3 mm long, c. 2.5 mm wide, thick, fleshy, yellowish green, covered with clusters of coarse projecting red or purple trichomes; margins recurved; apex obtuse. *Column* projecting at an angle to the ovary, 5-7 mm long, c. 2 mm wide, yellowish green with red markings, a patch of short trichomes on the anterior surface. *Anther* c. 1.2 mm long, c. 1.5 mm wide, verrucose, pinkish to red. *Pollinia* eight, lamellate, orange. Stigma quadrate, c. 1.6 mm across, deeply saccate. *Capsules* ellipsoid, about 10 mm long, 5 mm wide, slightly hairy. **Fig. 2.**

Distribution and ecology: A highly restricted species known only from South Australia growing amid dense shrubs and fern thickets in the peaty bogs of the Southern Mount Lofty Ranges, particularly on the Fleurieu Peninsula. Also observed in similar swamps at the western end of Kangaroo Island pre 1990 but there are no collections. Green leaves have been seen in most months of the year yet flowering has only been observed in late summer, the driest time of the year, indicating that rain is not required to induce flowering. Flowers can emerge directly from the substrate without a leaf present but have also been noted with a well developed leaf.

Flowering period: February and March.

Recognition: This species is most easily recognised by its glabrous scape, lanceolate to linear lanceolate, shiny, white or pink sepals and small ovate glabrous leaf which is mid-green on both surfaces. It is the only South Australian species to occur in swamps and the only one to flower in late summer.

Similar species: *Eriochilus paludosus* is generally similar to *Eriochilus cucullatus*, a species of woodland and heath (not peaty swamps) which does not occur in the Southern Lofty region (lower south-east only). By contrast *E. cucullatus* has a longer, smoother, paler lanceolate leaf and hairy green scape. Unlike *E. cucullatus* the new species usually occurs as single plants rather than in clusters.

Eriochilus collinus, also described as new in this paper, is much more bristly in all of its parts, has ovate sepals and a larger dark green bristly, corrugated, cordate leaf with a red to deep purple undersurface. The flowering times of the two species do not overlap.

Notes: This species was first collected in the 1990's when several South Australian botanical collectors independently located populations in three separate swamps south of Adelaide. It was first recorded in the Census of South Australian Vascular Plants (Barker *et. al.* 2005) under the tag name *Eriochilus* sp. Swamp (D.E.Murfet 1950b). The species is included in eFlora SA (Bates 2008-2014) as '*Eriochilus* species Swamp'.

Conservation status: Rare and endangered due to the drainage and other recent changes in its peat bog habitat and no longer present in any conservation reserves. Suggest 2E according to the criteria of Briggs & Leigh (1996).

Etymology: The Latin *paludosus*, growing in marshes or swamps, referring to its peat bog habitat.

Additional collections (all at AD): all from Southern Lofty region: Ashbourne Road Scrub, swamps, March 1966, *D. Hunt* sn (AD 98622051); Parawa Swamps, 26 March, 1988, *R.Bates 14017*; Yundi swamps, February 1998, *R.Bates 42232* (image only).

Acknowledgements

Thanks are due to staff at AD including librarian Lorae West, to ecologist Joe Quarmby, and to members of the Native Orchid Society of South Australia particularly Barb & Ken Bayley, June Niejalke and Ed Lowrey for providing images and advice. Appreciation to Emma Toms, Marion Garratt and Karina Richards for technical assistance at CANB. Special thanks to Denzel Murfet for specimens, photos and discussion over the years and Barbara Jones for companionship and help with various tasks. Photos by Robert Bates unless otherwise acknowledged.

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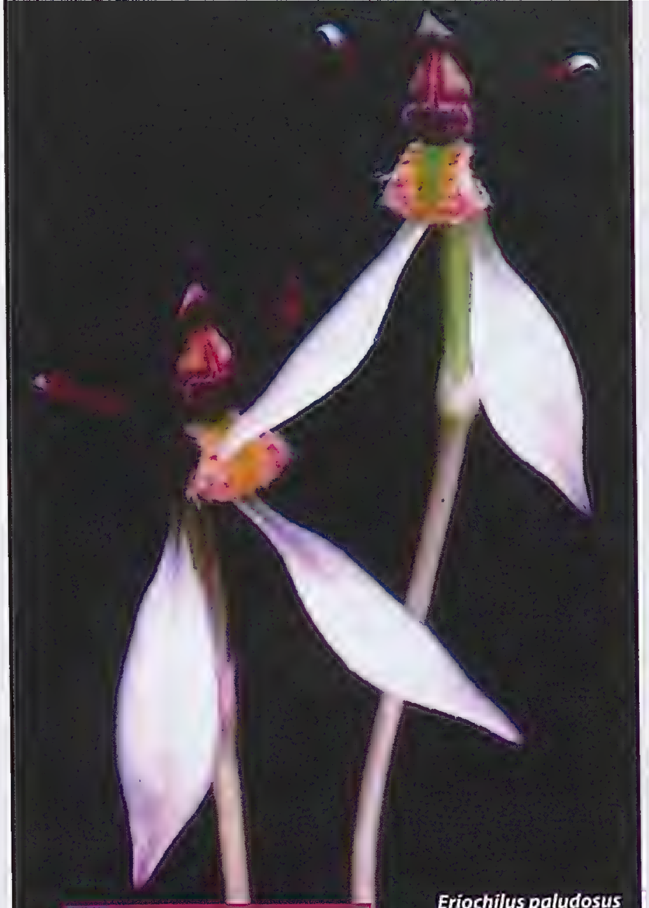
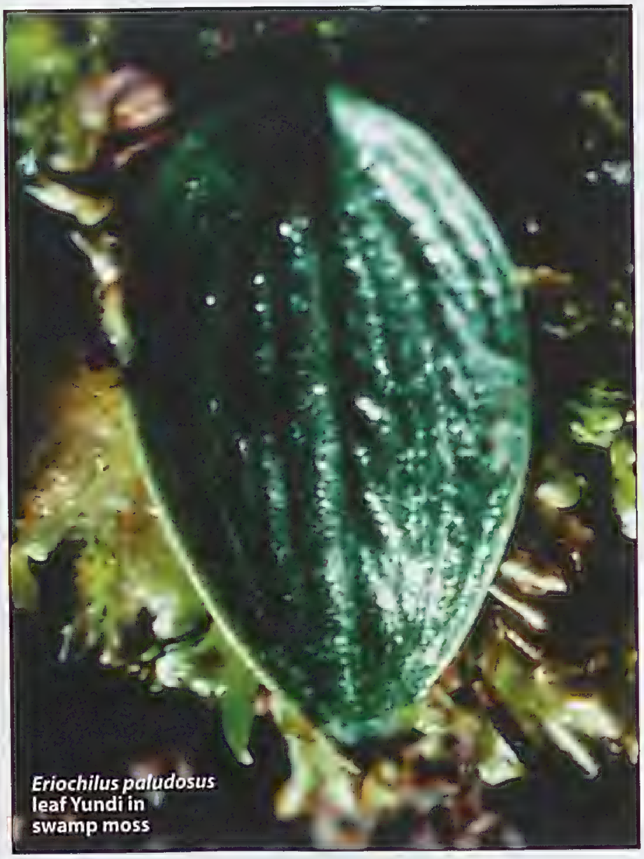


Eriochilus paludosus



Eriochilus paludosus leaf Yundi in swamp moss

Eriochilus paludosus, flowers in deep shade of swamp at Yundi

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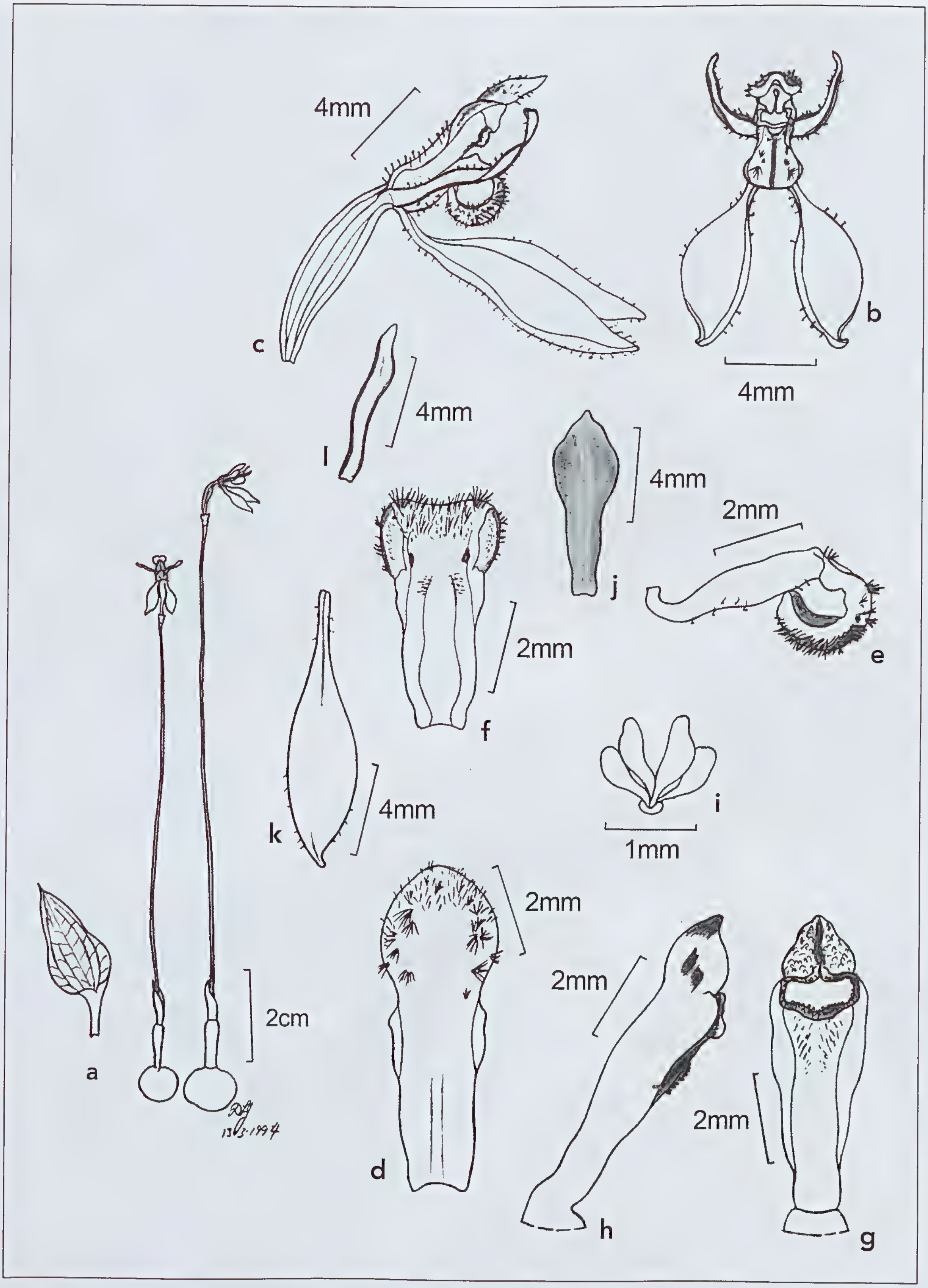
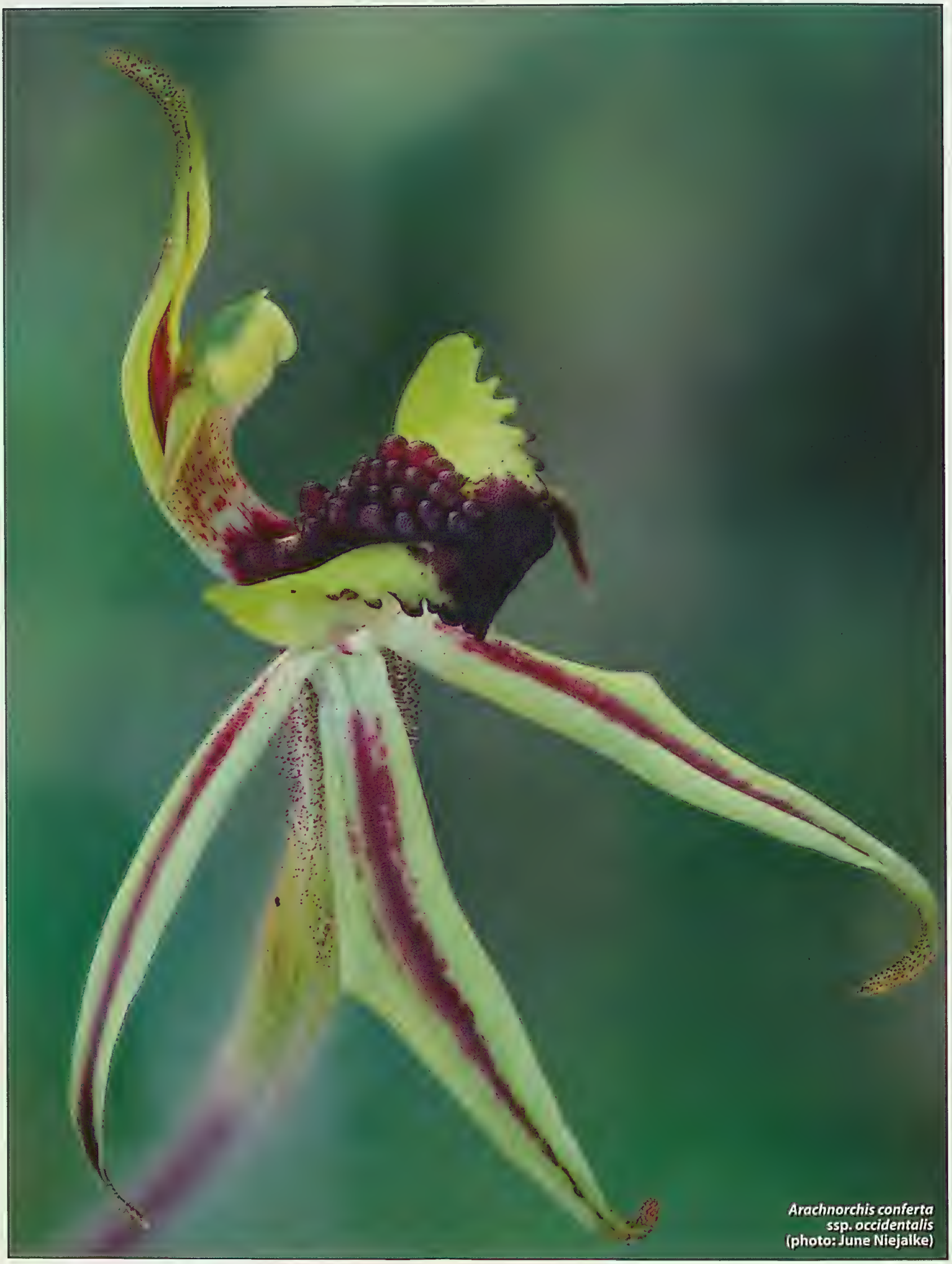


***Eriochilus paludosus*, c. 5 km east of Myponga, *SA, D.E.Murfet 1950* (part of type collection).**
a. flowering plants and separate leaf; b. flower from front; c. flower from side; d. labellum from above, flattened out; e. labellum from side; f. labellum from rear; g. column from front; h. column from side; i. hemipollinariun; j. dorsal sepal; k. lateral sepal; l. petal.
© D.L.Jones, drawn 13 March 1994. (**Figure 2.**)



Arachnorchis conferta
ssp. occidentalis
(photo: June Niejalke)

Three new green-comb Spider Orchids (*Arachnorchis* species) from South Australia

by Robert J. Bates

Abstract

Arachnorchis conferta ssp. *occidentalis*, *Arachnorchis diversiflora* and *Arachnorchis viriosa*, are described here as new. Illustrations are provided and notes included on their distribution, ecology and conservation status. Their distinguishing features are compared with those of allied taxa.

Key Words

Orchidaceae, *Arachnorchis viriosa*, *Arachnorchis diversiflora* and *Arachnorchis conferta* ssp. *occidentalis*, new taxa, South Australia, Australian flora.

Introduction

Arachnorchis was erected by Jones & Clements (2002) as a genus distinct from *Caladenia* R.Br. The status of the genus is supported by the morphological and molecular studies of Jones & Clements (2002). *Arachnorchis* is a complex genus of more than a hundred taxa all endemic to temperate Australia and all of which have a pair of waxy yellow structures at the base of the column; such structures do not occur in any other genus of the so-called "super" genus *Caladenia*.

This alone would be enough to separate *Arachnorchis* from any other genus but there are other distinctive features, including vegetative ones such as the fibrous tunicate sheaths on the tubers of all *Arachnorchis* species. In addition *Arachnorchis* have sepal osmophores covered with glands releasing scents (allomones) as sexual attractants, enticing male flower wasps (Thynnids). These wasps clasp and attempt to carry off the labellum, or its female wasp decoy which often looks like a wingless female wasp (at least to the male wasps). True *Caladenia* do not use this method to attract pollinators. The *Arachnorchis* / wasp relationship is a mostly specific one which has led to rapid speciation of the spider orchids. The author considers that global consensus would regard these features alone as enough to accept *Arachnorchis* as a genus in its own right. Recent DNA studies of *Caladenia* in the broad sense indicate that other genera once included in *Caladenia* including *Glossodia* and *Elythranthera* could well be returned to that genus (D.L. Jones pers. com.) but I do not believe that will happen; hence for the sake of consistency *Arachnorchis* should retain its generic status.

Jones (1991), Carr (1991), Bates et al have published many new South Australian *Arachnorchis* species since 1990 but there are gaps and omissions. South Australians have tended to keep a more conservative approach than other states. An example of this is the species *Arachnorchis tensa* (Carr) Jones & Clements which since 2004 has been regarded by Federal and Victorian conservationists as a highly localised, Nationally endangered species restricted to a small area of poor, sandy, Mallee adjacent the Victoria - South Australian border (Backhouse, Duncan, Jones pers. comm.) while South Australians regarded it as a common widespread species occurring across southern South Australia in a variety of habitats. The majority of these South Australian populations are now regarded as *Arachnorchis clavula* (D.L. Jones) Jones & Clem. while others belong to the new species *Arachnorchis viriosa* described here.

Materials and methods

Descriptions of the new taxa were made from fresh specimens. All types of *Arachnorchis* relevant to this study (and specimens cited) have been seen by the author while plants have been imaged *in situ* by the author and others associated with the project.

Taxonomy

1. *Arachnorchis conferta* (D.L. Jones) Jones & Clements ssp. ***occidentalis*** R.J. Bates **ssp. nov.** differing from ssp. *conferta* in its overall smaller size, clumping habit, long silky trichomes on leaf and base of scape, diminutive dorsal sepal, tiny, gladiolate, medially grooved osmophores on tepals, labellum twice as broad as long, margins usually not, or minutely toothed compared to ssp. *conferta*; labellum calli bunched, grapelike, restricted to a small area in the centre of the labellum; throat of labellum finely speckled red, see image; column short and broad compared to ssp. *conferta*.

Type: South Australia, Eyre Peninsula region, Bascombe Well in red sand under native pines near old stockyard, 16 Sept 2013, *R.J. Bates 95333* (holo AD).

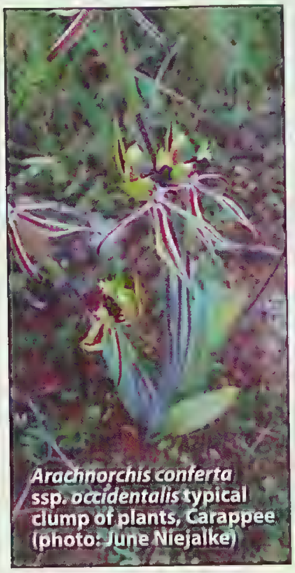
Description: *Dwarf, hirsute, tuberous terrestrial* orchid 5-9 cm tall, usually in clumps of 2-6 plants, *tuber* not seen. *Leaf* lanceolate, 30-40 mm long, 3-10 mm wide, sub-erect, green with some red markings basally, a scattering of eglandular hairs on both surfaces. *Scape* 5-8 cm tall c. 1 mm wide, maroon-red, longitudinally channelled, densely pubescent with a mix of long, silky white, glandular and eglandular trichomes; *eglandular trichomes* to 5 mm long with a swollen basal cell; glandular trichomes shorter (less than 1 mm long) and more numerous distally. *Sterile bract* ovate-lanceolate, clasping, 5-6 mm long, c. 3 mm wide, shortly acuminate to mucronulate, the mucro, short, hooked, red. *Floral bract* similar, pale, 5-6 mm long, c. 3 mm wide, loosely enclosing the pedicel. *Pedicel* slender, red, 3-4 mm long, 0.5 mm wide, beset with short, mostly glandular trichomes c. 0.2 mm long. *Ovary* sub cylindrical, 3-5 mm long, c. 2 mm wide, ribbed, green, densely covered with gland tipped trichomes to 1 mm long, the glands tiny, ovoid, dark maroon. *Floral segments* all terminating in tiny flat osmophores. *Sepals* 10- 20 mm long, 3-4 mm wide, lanceolate, cream with broad red medial stripe, *proximal margins* with scattered gland tipped hairs. *Dorsal sepal* c. 10 mm long, erect, sigmoid, with incurved or involute margins, hardly hooding the column; *osmophore* orange or brown, 1-2 mm long c. 0.4 mm wide, flattened and grooved, sub-acute. *Lateral sepals* 15-20 mm long, sub falcate, elbowed, broadest near the middle, spreading in front of the labellum, decurved distally; *osmophores*, bayonet shaped, orange or brown with a median groove, 1-2 mm long, c. 0.5 mm wide, subacute, *glands* not *stalked*, sparse, tiny, red. *Petals* spreading on either side of labellum, 12-15 mm long, c. 2 mm wide, cream with red medial stripe; *osmophores* flattened 1-2 mm long less than 1 mm wide, with a needle like, often deciduous mucro; *glands* irregularly spaced and often extending to the petal lamina. *Labellum* yellow green, bow-shaped, c. 10 mm wide, 5-6 mm long on a tremulous, red edged and speckled claw c. 1.2 mm long, 1 mm wide; labellum *throat* cream, marked with clusters of red spots and blotches; *distal lamina* much narrowed, red, c. 4 mm long, 3 mm wide, *central lamina* flat with an untidy, grape like cluster of sub-globular, mostly sessile, maroon calli, often papillose, to 0.4 mm wide; *labellum margins* mostly smooth or dentate in the distal third, the teeth c. 0.4 mm long, red tipped; *labellum side lobes* indistinct or absent. *Column* short and broad c. 10 mm tall, 3 mm across, widest at base, reddish; *column wings* narrow, *base of column* with a pair of deep yellow, comma shaped, waxy structures less than 1 mm long, c. 0.5 mm wide; *anther* c. 2 mm long, red brown, obtuse; *pollinia* clavate, 1 mm long; *stigma* semi-lunulate, 1.5 mm long c. 1 mm wide. *Capsule*, densely glandular hairy, obovoid, c. 7 mm long, 3 mm wide.

Illustration: none seen.

Distribution and ecology: Endemic to South Australia, restricted to central and eastern Eyre Peninsula in more fertile soils, often red sands in grassy shrub-lands, with herbs and forbs under native pines (*Callitris* spp.), usually with other *Arachnorchis*, including green comb spider orchids such as *Arachnorchis septuosa* and *Arachnorchis clavula* as well as *Arachnorchis zephyra* and greenhoods such as *Hymenochilus* spp and *Oligochaetochilus* spp, many of them undescribed. Flowers appear from late August into September and are pollinated by sexually attracted male wasps *Aeolothynnus* sp. (Bates unpublished).

Recognition: Has previously been included in a broader concept of *Arachnorchis conferta* (Bates 2005 in Barker & Barker et al.) but also been mistakenly identified as *Arachnorchis toxochila*. Differs from ssp. *conferta* in its much smaller size, differently shaped flowers with mostly smooth margins to the labellum and fewer, smaller calli. *Arachnorchis toxochila* on the other hand differs from both these taxa in lacking osmophores, in having the lateral sepals deflexed against the ovary and with labellum calli in rows. All three taxa have different distributions with no overlap.

Notes: *Arachnorchis conferta* is a member of the dwarf green-comb spider orchids, of which there are now at least six taxa recognised throughout South Eastern Australia with some extending into the semi-arid interior and each with a different highly specific pollinator. The spider orchids (*Arachnorchis*) do not belong in *Caladenia* in the strict sense. The distribution of the two genera does overlap and while *Caladenia* occur in New Zealand but not in Western Australia the reverse is true of *Arachnorchis*, indicating a different point of origin.

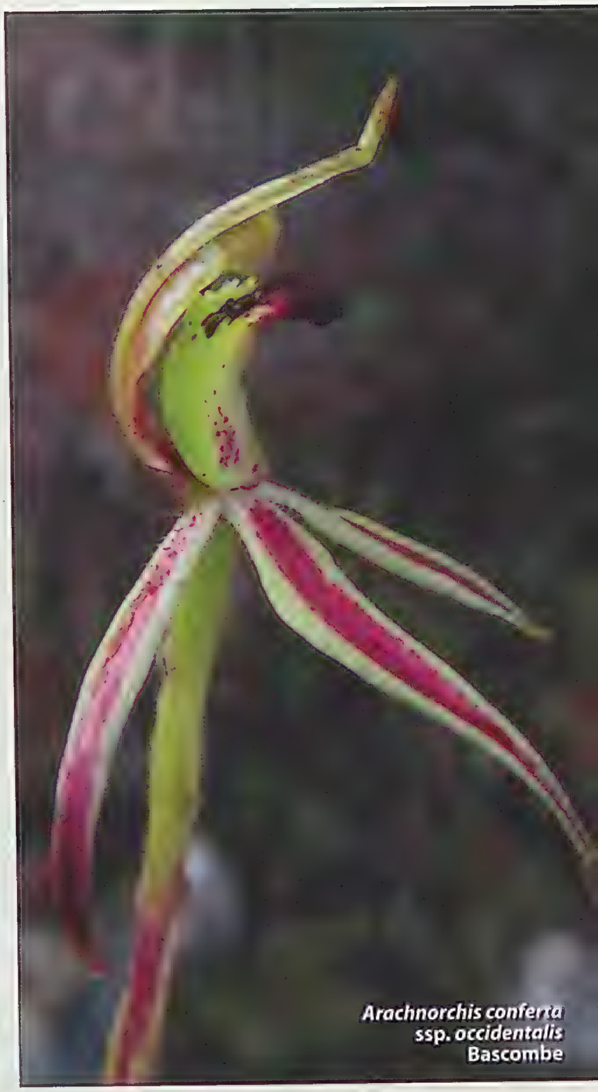


***Arachnorchis conferta* ssp. *occidentalis* typical clump of plants, Carappee (photo: June Niejalke)**

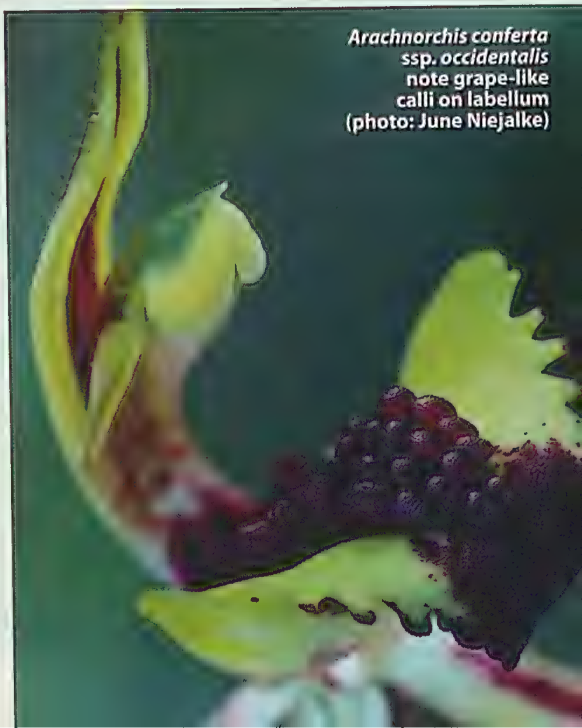
Conservation status: unfortunately for the two subspecies of *Arachnorchis conferta* they both require very fertile, moisture retentive, arable soils so that 95% of their habitat has been cleared for cultivation, ensuring they are both endangered, the ssp. *occidentalis* critically so.

Etymology: from Latin *occidentis*, of the west, referring to the more westerly distribution of the new subspecies.

Other collections seen at AD all South Australia, Eyre Peninsula: Blue Range (Hincks CP), foothills, in sandy loam along creek bank, 7 Oct. 1968 *R.C. Nash s.n. AD 96918286*; Carappee Hill C.P. 31 Aug, 2013, *J. Niejalke BS739-605*.



Arachnorchis conferta* ssp. *occidentalis
Bascombe



***Arachnorchis conferta* ssp. *occidentalis* note grape-like calli on labellum (photo: June Niejalke)**

2. *Arachnorchis diversiflora* R.J. Bates ***sp. nov.*** With affinity to *Arachnorchis reticulata* (Fitzg.) D.L. Jones & M.A. Clements but differing in its mix of short and medium length, patent trichomes on leaf and scape, (unlike the very long silky ones of *Arachnorchis reticulata*); and whereas the flowers of *Arachnorchis reticulata* are a constant red with creamy reticulate veins those of *Arachnorchis diversiflora* are very diverse, not only in colour but also in shape, ranging from white with red labellum to tricolored red, white and green and-less often wholly red or red with pale green veins. Furthermore the labellum of *Arachnorchis diversiflora* is not trilobed, but consistently broad with four, well-spaced rows of calli; it also has the lateral sepals and petals broad and spreading in the proximal half and pendulous in the distal half; the sepals with longer, narrower, often shiny osmophores.

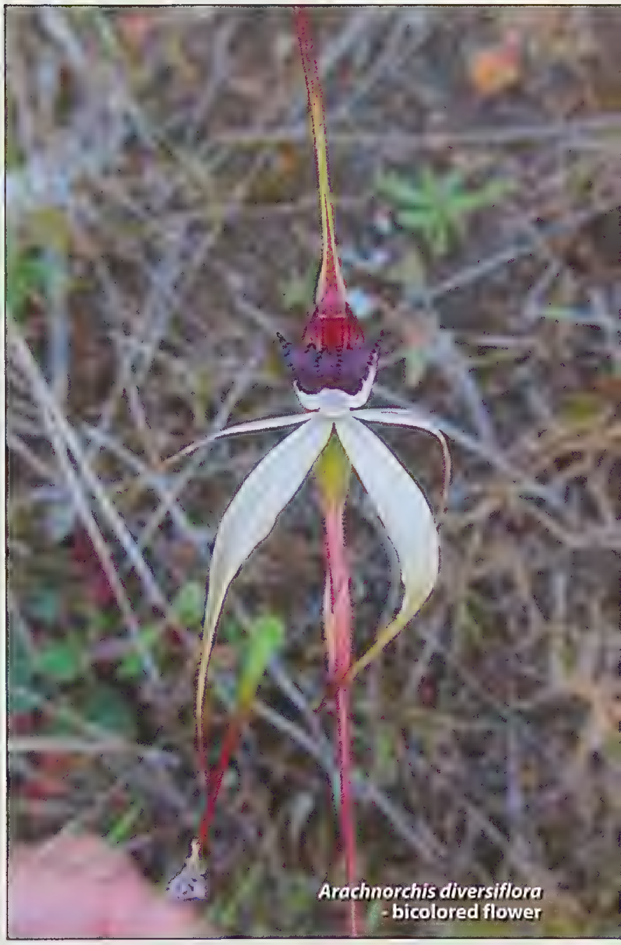
Type: South Australia, Eastern Mount Lofty Range, Rockleigh, Sept 2013, *R.J. Bates* and *Peter Watts* (holo AD).

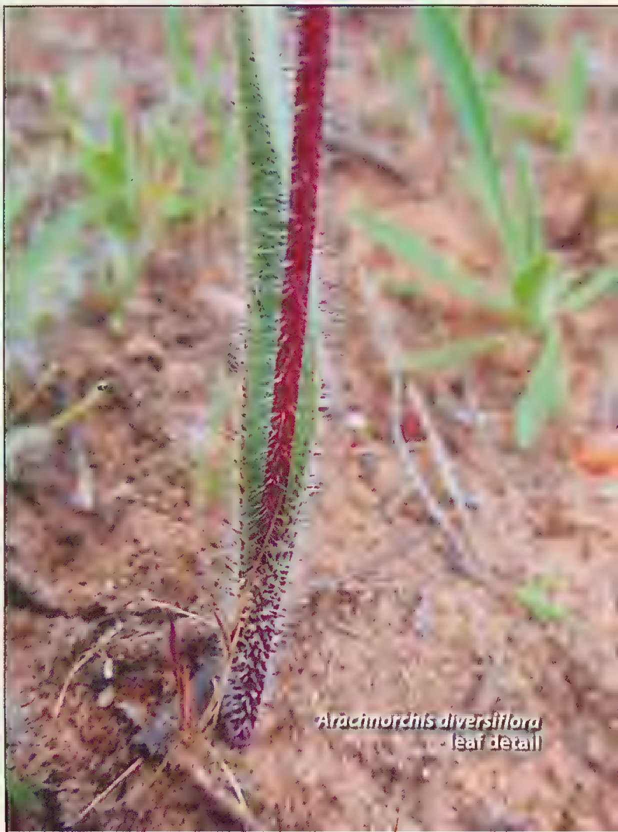
Description: *Tuberous, hirsute, terrestrial* orchid to 20 cm tall, *growing in loose groups*. *Tuber globular*, 10-15 mm diam., enclosed in a fibrous, tunicate sheaths. *Leaf* single, linear lanceolate, erect, 3-5 cm long, c. 2 mm wide, green with a red base, sheathing the lower scape, *lamina* irregularly blotched with purple; hirsute,with a mix of patent, short and medium eglandular trichomes c. 1 to 2 mm long. *Scape* slender, 8-20 cm tall, 1-1.2 mm wide, deep maroon to pink and green, with diverse, often gland tipped, short or long trichomes to 2 mm long, the glands globular c. 0.1 mm diam. *Sterile bract* similar to leaf, red, clasping, linear-lanceolate, 10-20 mm long, by c. 1 mm wide; glabrous or with short eglandular trichomes. *Floral bract* ovate, c. 20 mm long, 2-3 mm wide, acute, sheathing base of ovary. *Ovary* sub-cylindrical, to 10 mm long, 3 mm wide, green with red ribs; covered with short white pubescence, the trichomes mostly gland tipped. *Flower* single, multi-coloured, red, cream, purple and pale-green or brown; *Sepals* 4-7 cm long by c. 4 mm wide; varicoloured, cream, white or yellow, with many red lines of varying width and intensity; *sepaline osmophores* 4-10 mm long by 0.2 mm wide, maroon; *glands red*, dense and beadlike. *Dorsal sepal* erect, broad at the base then filiform; *lateral sepals* broad and spreading in the lower half, 3-5 mm wide, deflexed or pendulous past the middle, tapering to a filiform apex. *Petals* 20-30 mm long by 2-3 mm wide, cream or yellow with a red median line, broad and spreading at first then narrow and deflexed past the middle, apex acuminate and without osmophores. *Labellum* on a tremulous claw 1 mm long by 1 mm wide; *lamina* not or hardly lobed c. 10 mm long by 10 mm wide at the broadest point, varicoloured, often creamy in the lower half but maroon or red toward the gradually tapered, revolute, emarginate apex; *margins* with variable red teeth to 1 mm long, acute or rounded. *Central lamina* with 4-6 rows of golf club shaped, red calli to 1 mm tall. *Column* red, 9-12 mm tall, curved and winged with a pair of elliptical, yellow, shiny, mounded structures at the base; *column wings* to 0.2 mm wide, translucent, with undulate margin; *anther* maroon, rounded; *pollinia* flattened, *stigma* quadrate to 1 mm across.

Distribution and ecology: Past distribution most likely included the grassy Eucalypt woodland on fertile soils throughout the stony, east facing slopes of the Mount Lofty Ranges from about Murray Bridge, north to the Burra Hills.

Presently known only from *Eucalyptus porosa* woodland in alluvial loams, with large rocks or half buried boulders, with shrubs of spiny *Bursaria* and drooping sheoaks *Allocasuarina verticillata*. Such habitat has been largely grazed out and most of the less rocky land planted to cereals. Flowering occurs in early spring, mostly in September and flowers are pollinated by sexually attracted thynnid wasps. Orchids occurring with *Arachnorchis diversiflora* include *Diuris palustris*, *Hymenochilus* spp., *Pheladenia deformis* and *Caladeniastrum latifolium*; together displaying many glorious colours, added to by the flowers of many vernal lilies; giving us some idea of what most of the Mount Lofty Ranges looked like before European settlement.

Recognition: Characterised by the colourful and variable flowers, the often surprisingly dark red scape with its variable, glandular and eglandular, perpendicular trichomes. The broad, flat, un-lobed labellum is unusually colourful compared to most members of the so called 'reticulata complex'. Sepals and petals are broadly spreading at their base then suddenly narrowed and pendulous with red cylindrical clubs on the sepal tips. The many narrow red stripes on the sepals is unlike the single red median stripe on most spider orchids. Even the column of *Arachnorchis diversiflora* is unusually deep red, this colour extending to the anther.


Arachnorchis diversiflora - bicolored flower


Arachnorchis diversiflora - leaf detail

Notes: *Arachnorchis diversiflora* was discovered in 2012 by Rockleigh farmer Peter Watts. In this day and age it is unusual for a colourful new orchid to be found in agricultural land close to a capital city especially by a farmer and even more unusual for it to be reported to a State Herbarium. The variable flowers could have seen the plants interpreted as hybrids but today there are no possible parent species near Rockleigh which is too dry for *Arachnorchis reticulata* and has no suitable habitat for *Arachnorchis strigosa*. It is possible that *Arachnorchis diversiflora* arose before settlement as a cross between two unknown, perhaps now extinct spider orchids. This could explain the floral variation in this now self-perpetuating taxon.

Similar species: most closely related to *Arachnorchis strigosa* and *Arachnorchis colorata* but also resembles *Arachnorchis reticulata* of the Adelaide Hills. The latter differs in its long silky trichomes on leaf and lower scape, the former in the dense, strigose indumentum on its leaf and scape. *Arachnorchis colorata* differs also in its sepals not being clubbed. *Arachnorchis diversiflora* is a species of rocky hills in mixed *Eucalyptus porosa - Allocasuarina verticillata* grassy, herbaceous woodlands. The leaf has bristly trichomes, the scape to 20 cm tall with varicoloured flowers (red, white or cream, and purple-pink), to 4 cm across, sepals broad at base, to 3 cm long, cream or white with or without centre stripe, filiform tips, dorsal sepal erect, lateral sepals drooping, labellum broad, hardly lobed, deep red of with paler stripes, with short red labellum calli in four sparse rows, the marginal teeth variable in shape and size. *Arachnorchis strigosa* occurs in sandy soils of the near coastal plains, never in the hills. *Arachnorchis reticulata* on the other hand prefers high rainfall areas, mostly in the mountains. Each of these is pollinated by a different thynnid wasp species (pers. obs.).

Conservation status: Unless further populations are discovered *Arachnorchis diversiflora* must be regarded as critically endangered as its habitat is grazed by sheep and adjoins cropping land. A drying climate and an increasing list of weeds and insect pests add further pressure. The 2015 season saw all leaves and buds damaged by red legged earth mites so there were no flowers.

Etymology: *diversiflora* with Latin roots refers to the diverse flower shapes and colour.

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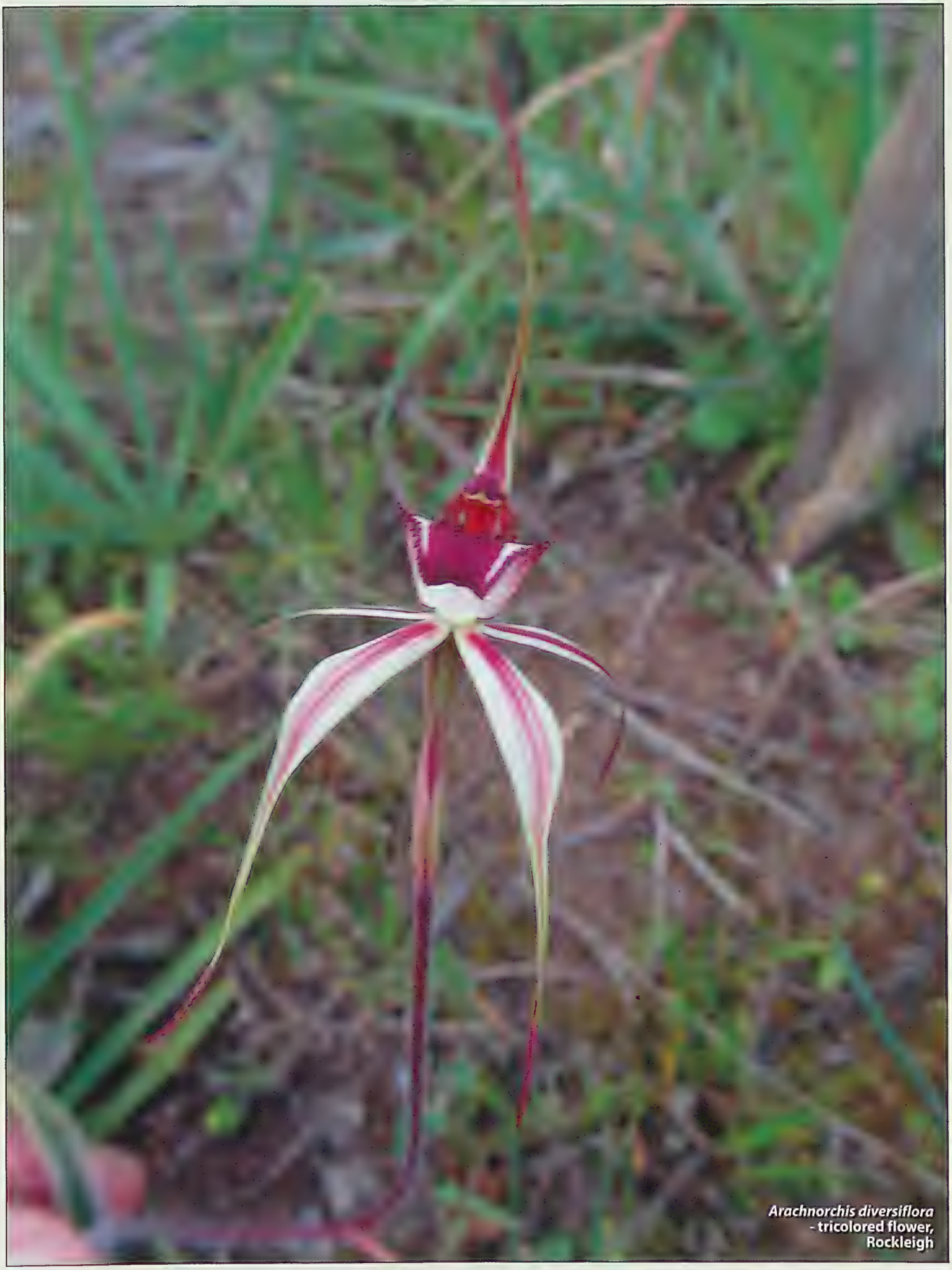


Arachnorchis diversiflora - tricolored flower, Rockleigh

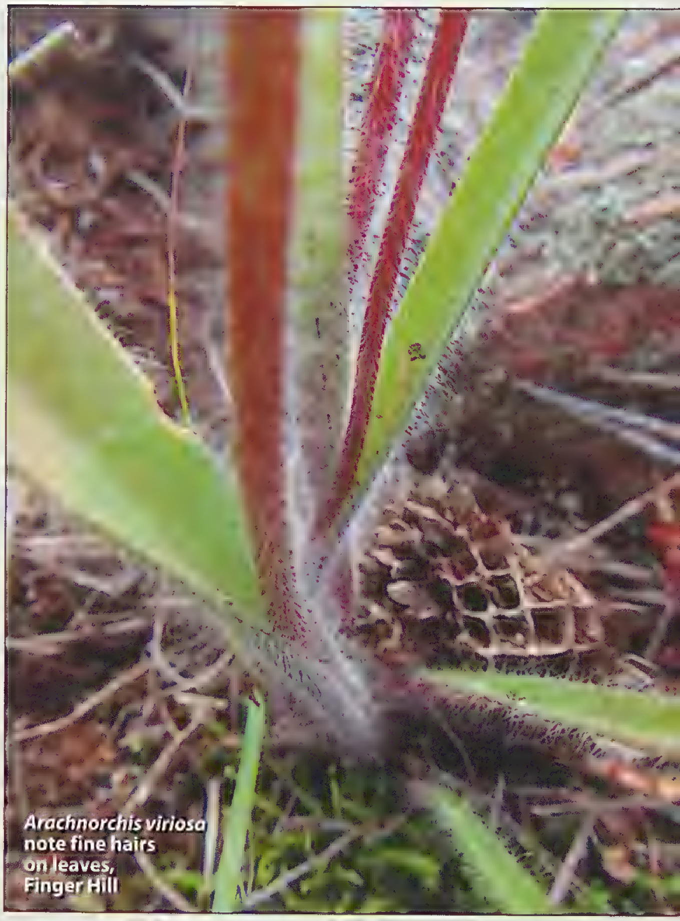
3. *Arachnorchis viriosa* R.J. Bates ***sp. nov.*** with affinities to *Arachnorchis clavula* D.L. Jones but differing in its taller, more robust habit (to 45 cm tall); longer, erect, linear-lanceolate leaf to 10 cm long; robust scape with numerous long white, silky, patent trichomes; larger, red, white and green flowers to 70 mm across, with longer, less distinctly clavate sepals (the osmophores mostly longer than 10 mm); lateral sepals held well in front of the flower, to 60 mm long; petals strongly deflexed; labellum larger with very long basal fringe reaching higher than the column; its throat mostly white, unlike the pale yellow throat of *A. clavula*; the mid lobe attenuate with incurved margins, tip curled under. The labellum calli are taller, in three rows and usually have white or cream bases unlike the wholly red calli of *Arachnorchis clavula*. The column of *Arachnorchis viriosa* is longer and white, the anther with a long, erect, straight mucro compared to the often short, hooked mucro of *Arachnorchis clavula*.

Types: South Australia, Eyre Peninsula, Elbow Hill on narrow N-S ridges leading to the summit, 2 km from the Lincoln Highway, overlooking the sea, 10 Sept. 2013, *R.J. Bates 95334* (holo AD, iso AD).

Illustrations: none seen.

Description: *Tuberous, hirsute, terrestrial* orchid 25 to 40 cm tall, forming clumps, loose colonies or as isolated individuals, tuber not seen. *Leaf* linear lanceolate, yellow green, erect 10 to 20 cm long, 7-11 mm wide; *base* with overlapping scarious sheaths 6-10 mm long, *lamina* green with maroon or red tints, with numerous fine, white, patent trichomes 1-1.5 mm long; *apex* subacute. *Scape* 20-45 cm tall, robust, rigidly erect, 2-2.5 mm diam., one or two flowered, red, with numerous silky, perpendicular, white trichomes 4-7 mm long, the lower ones eglandular, those above gradually replaced by shorter, glandular, tipped hairs, *the glands* c. 0.1 mm diam., maroon. *Sterile bract* lanceolate, acuminate, clasping, green with occasional red spots, 8-12 mm long, c. 5 mm wide, acute. *Floral bract* lanceolate c. 10 mm long, 5 mm wide with scattered patent, eglandular hairs c. 0.4 mm long. *Ovary* narrowly obovoid to cylindrical 7-8 mm long, c. 3 mm wide, mostly green, densely covered with short, gland tipped trichomes less than 1 mm long. *Flowers* 50-80 mm across, green, red and pale yellow green, with a white throat to the labellum; *segments* 30-60 mm long, 2-3 mm wide, cream, with a maroon medial stripe often taking up most of the lamina. *Sepals* with long, slender or indistinct, dull, yellow-green osmophores. *Petals* without osmophores. *Dorsal sepal* erect, linear, 30-50 mm long, 2-3 mm wide, not hooding the column; *osmophore* yellow- green, 5-15 mm long, 0.5 mm wide; *glands* single celled, red, sparse, c. 0.02 mm diam. *Lateral sepals* similar, 30-60 mm long, to 6 mm wide, held horizontally in front of the labellum, somewhat falcate, broad in the proximal half, elbowed near the middle then narrowed; *distal section* filiform and obliquely deflexed. *Petals* similar but smaller, to 30 mm long, without osmophores, strongly deflexed, *apex* attenuate. *Labellum* on a short white, tremulous claw to 2 mm long; *lamina* bow shaped, as wide as long (20-30 mm x 20-30 mm when flattened); decumbent, red, white and green, tri-lobed, the mid lobe narrow, maroon, recurved to revolute ; *side lobes* green, erect, deeply fringed with narrow teeth, 5-12 mm long, c. 1mm wide, the proximal teeth forked; *labellum throat* white or cream, *central lamina* with three rows of deep maroon, linear calli which are often cream or white based, 2-3 mm long, 0.2-0.4 mm wide, *proximal calli* longest, shape variable but all with a filiform stalk, some with a globular apex, others golf club shaped or with, hooked and flattened apices, a pair of shorter sentinel calli at the base. *Column* cream or white, sometimes spotted red, c. 10 mm long, 2 mm wide, linear, sub-falcate with a pair of comma shaped, deep yellow, waxy structures near the base, (these often hidden by the labellum), the *central column* with angular translucent wings to 1 mm wide; *anther* green 3-4 mm long, 1.5 mm wide, *apex* with a straight, erect mucro to 2 mm long. *Stigma* quadrate c. 1.5 mm wide; *pollinia* c. 3 mm long, ellipsoid, clavate.

Distribution and ecology: Endemic to South Australia where mostly restricted to the coastal ranges of eastern Eyre Peninsula with smaller populations in the northern Mt Lofty Ranges. Grows on slopes and ridges in mallee-broom-bush shrub-land with scattered she-oaks (*Allocasuarina verticillata*) and an understorey of porcupine grass (*Triodia*) with vernal flowering forbs and herbs. Flowering occurs mostly in September and October. Pollinated by a large, shiny black thynnid wasp, as yet unidentified.



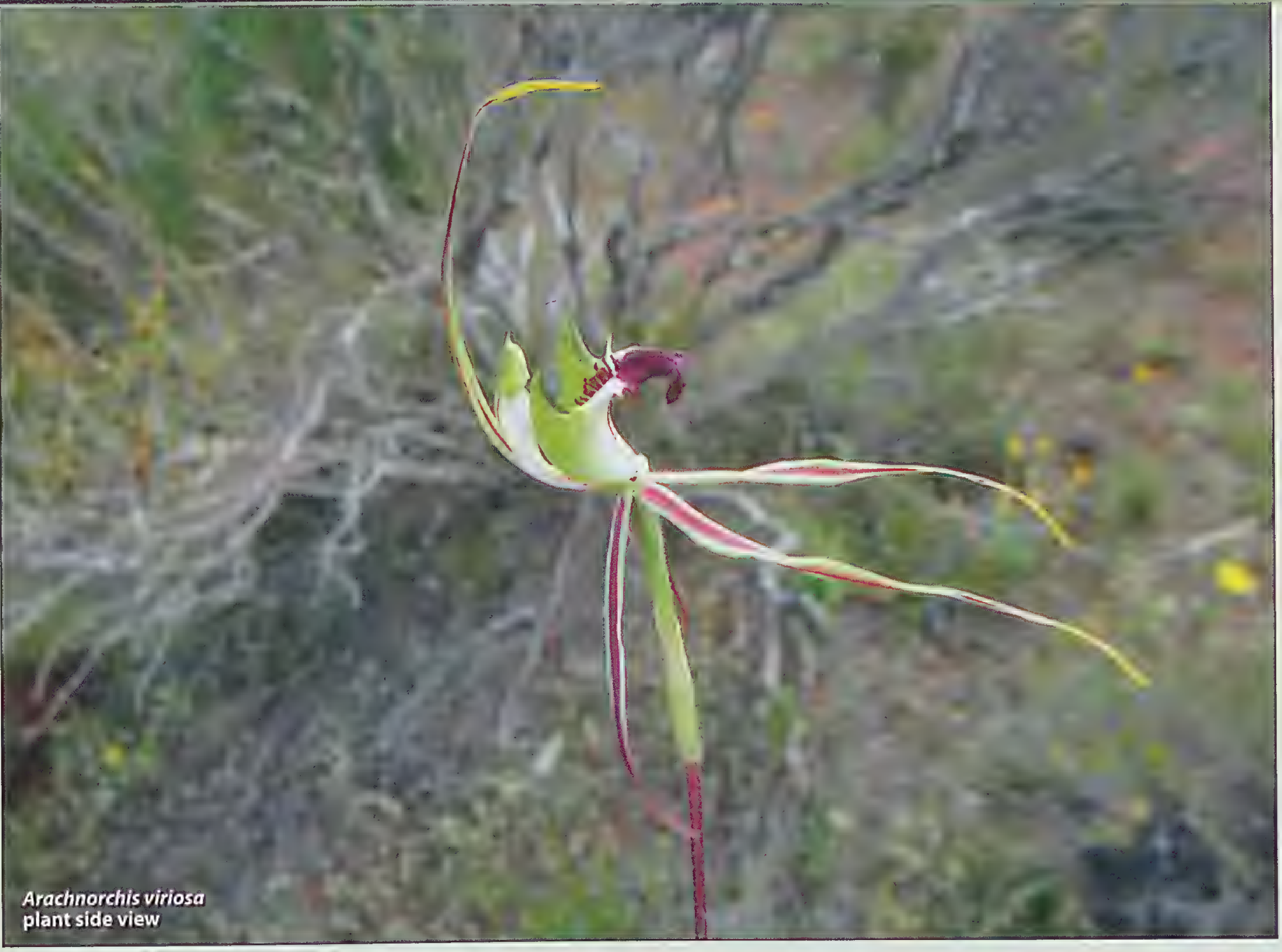
Arachnorchis viriosa note fine hairs on leaves, Finger Hill

Recognition: characterised by the combination of linear, erect leaf, tall, vigorous scape with long, patent white, silky trichomes, compared to the short trichomes of *Arachnorchis clavula*; the large red, white and green flowers with long green fringe on the labellum margins, this fringe reaching higher than the column; shorter and white or red teeth on the mid-lobe margins; the very slender calli with their often white bases and narrow heads, and the pale column.

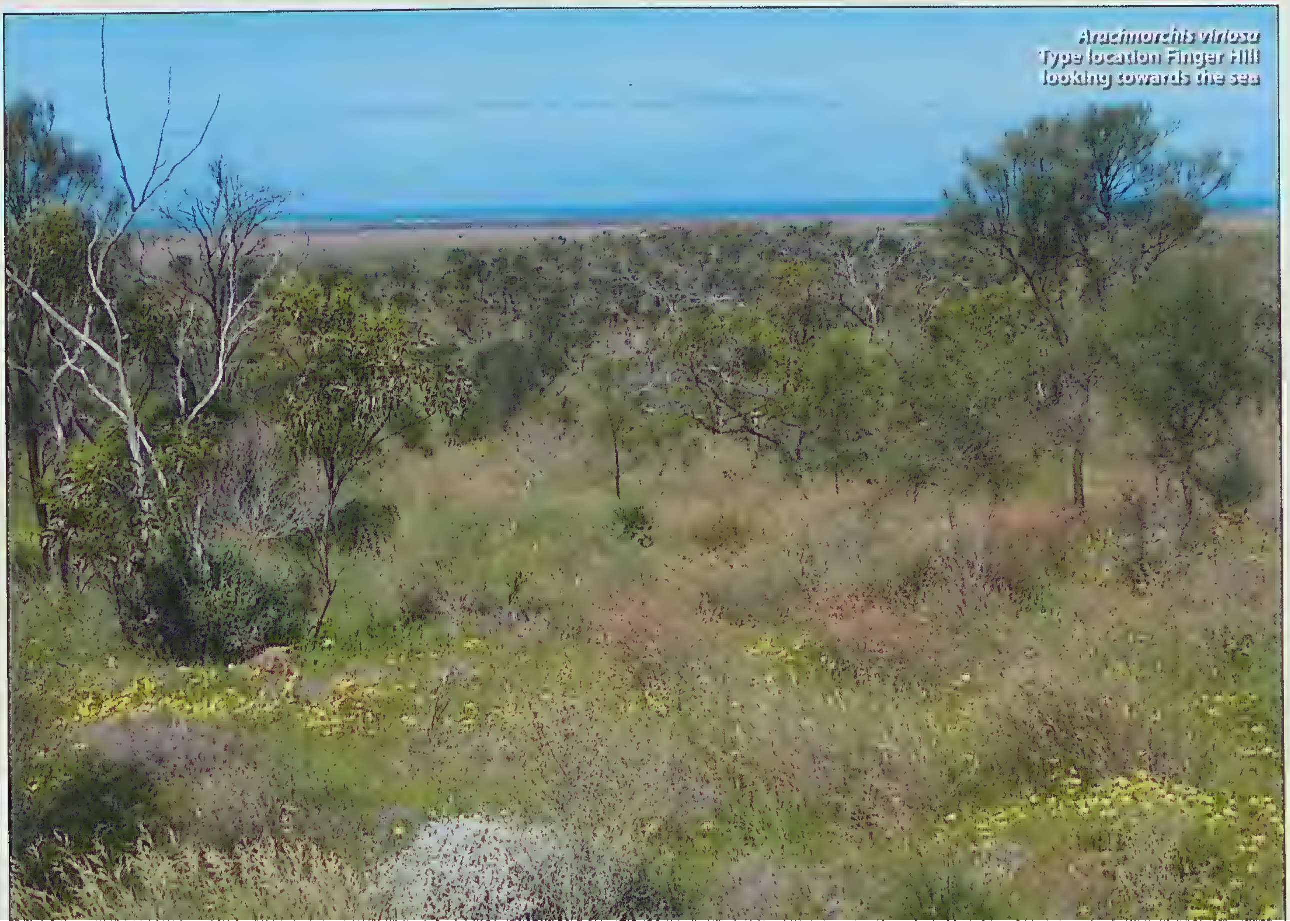
Other similar species: *Arachnorchis tentaculata* with which the species was previously included has even larger flowers, with long floppy sepals and even longer fringe to the labellum. *Arachnorchis interanea* is another tall species from Eyre Peninsula but as the name suggests this one grows well inland, is more lanky, often only held erect by the vegetation around it; lacks the really long hairs on the scape and has less colourful flowers and a labellum leaning forward, with very few long teeth in the labellum fringe and no white-based calli on the labellum lamina

Etymology: *viriosa* Latin virile, strong, referring to the robust plants with large flowers.

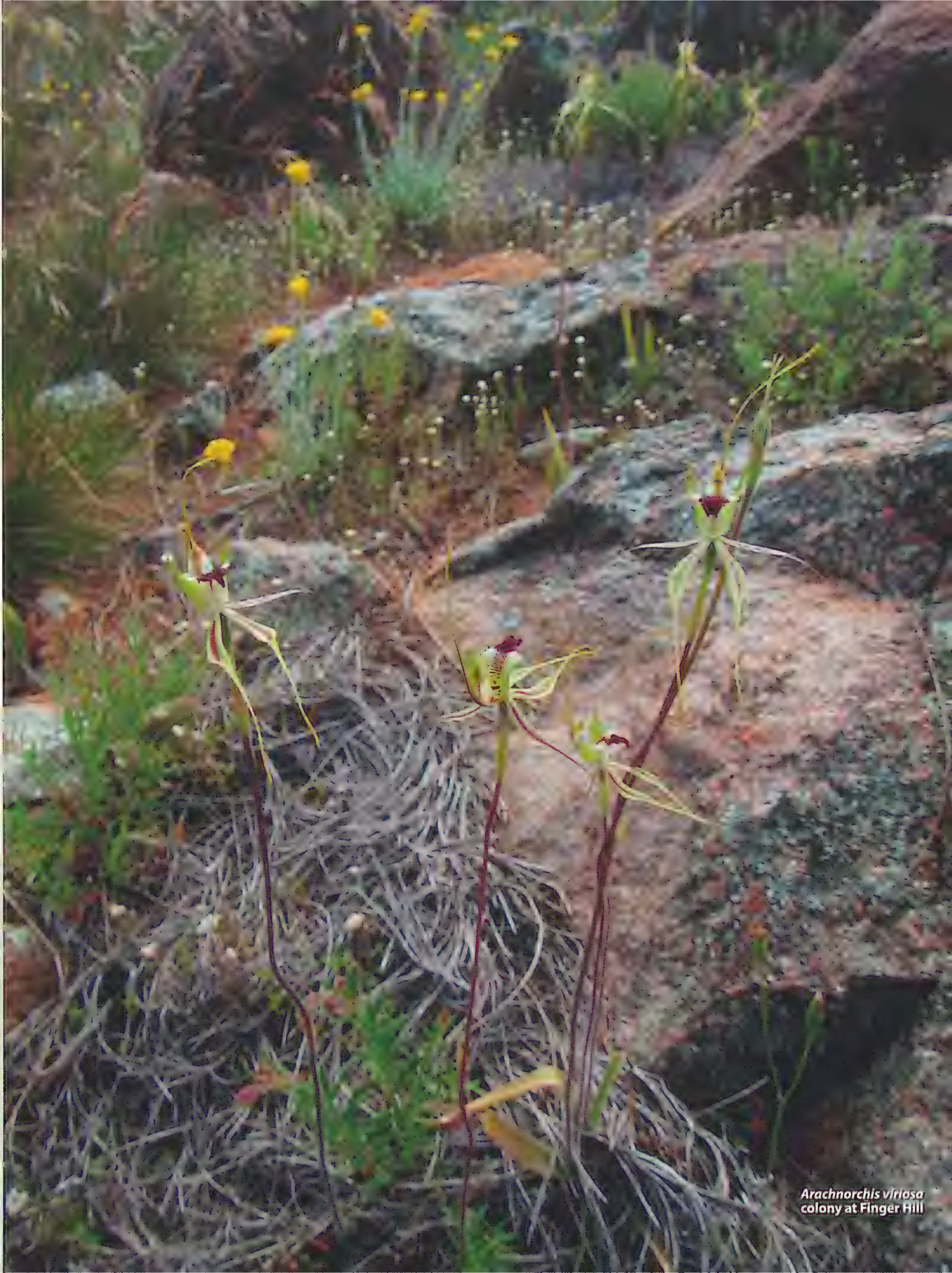
Conservation status: locally common, appearing in large numbers in higher rainfall years, although any further clearance or grazing of its habitat may tip the balance, suggest 3RCi after the criteria of Briggs & Leigh 1996.



Arachnorchis viriosa
plant side view



Arachnorchis viriosa
Type location Finger Hill
looking towards the sea



Arachnorchis viriosa colony at Finger Hill

Acknowledgements

Thanks are due to the many members of the Native Orchid Society of South Australia for locating, imaging and collecting specimens of the orchids named above, especially Barbie and Ken Bayley, June Niejalke, Ed Lowrey and Andrew Primer. Thank you also to Juergen Kellermann and Lorae West at AD for their support of this project and my wife Novi for technical assistance. Photos in the article by the author except where noted.

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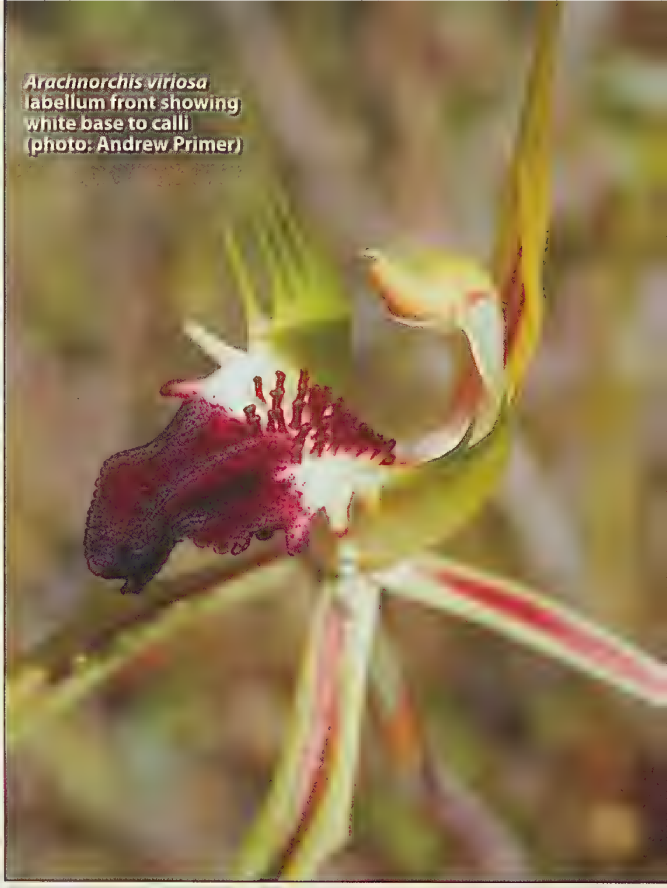
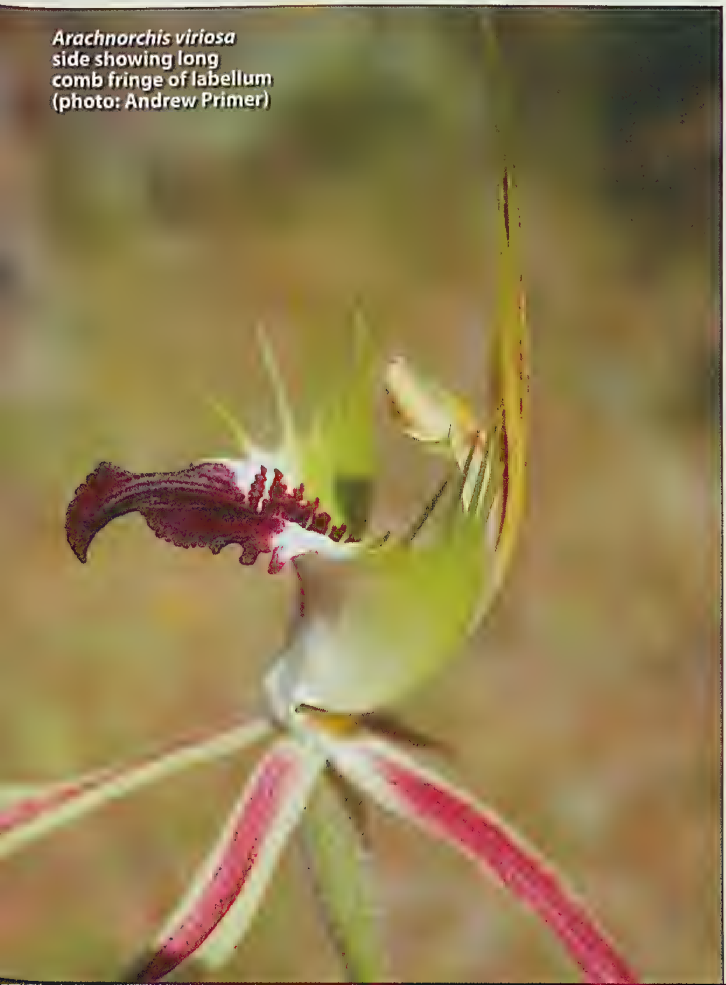
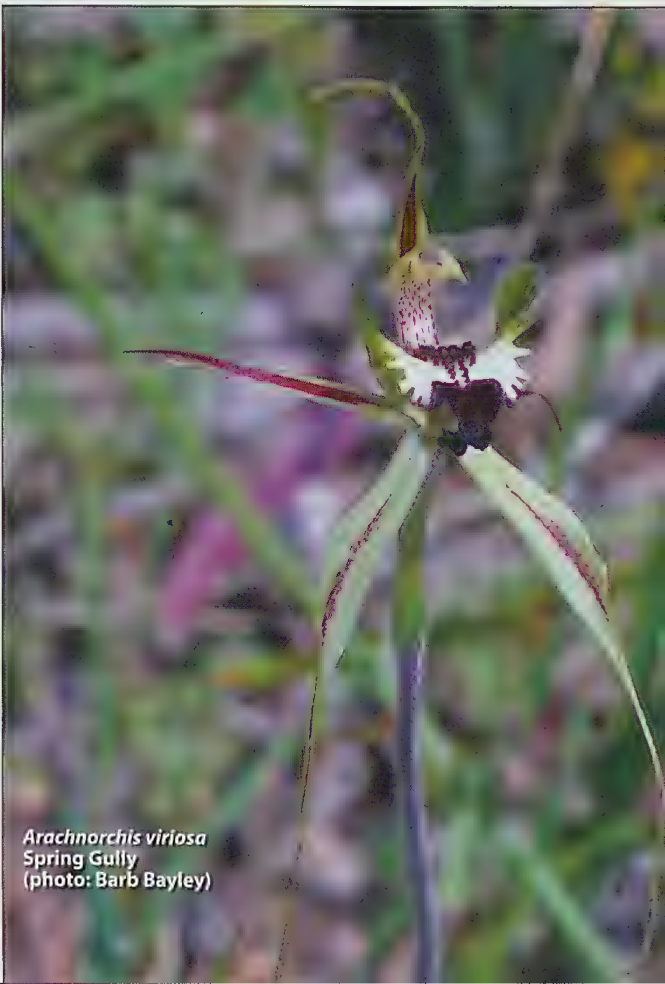


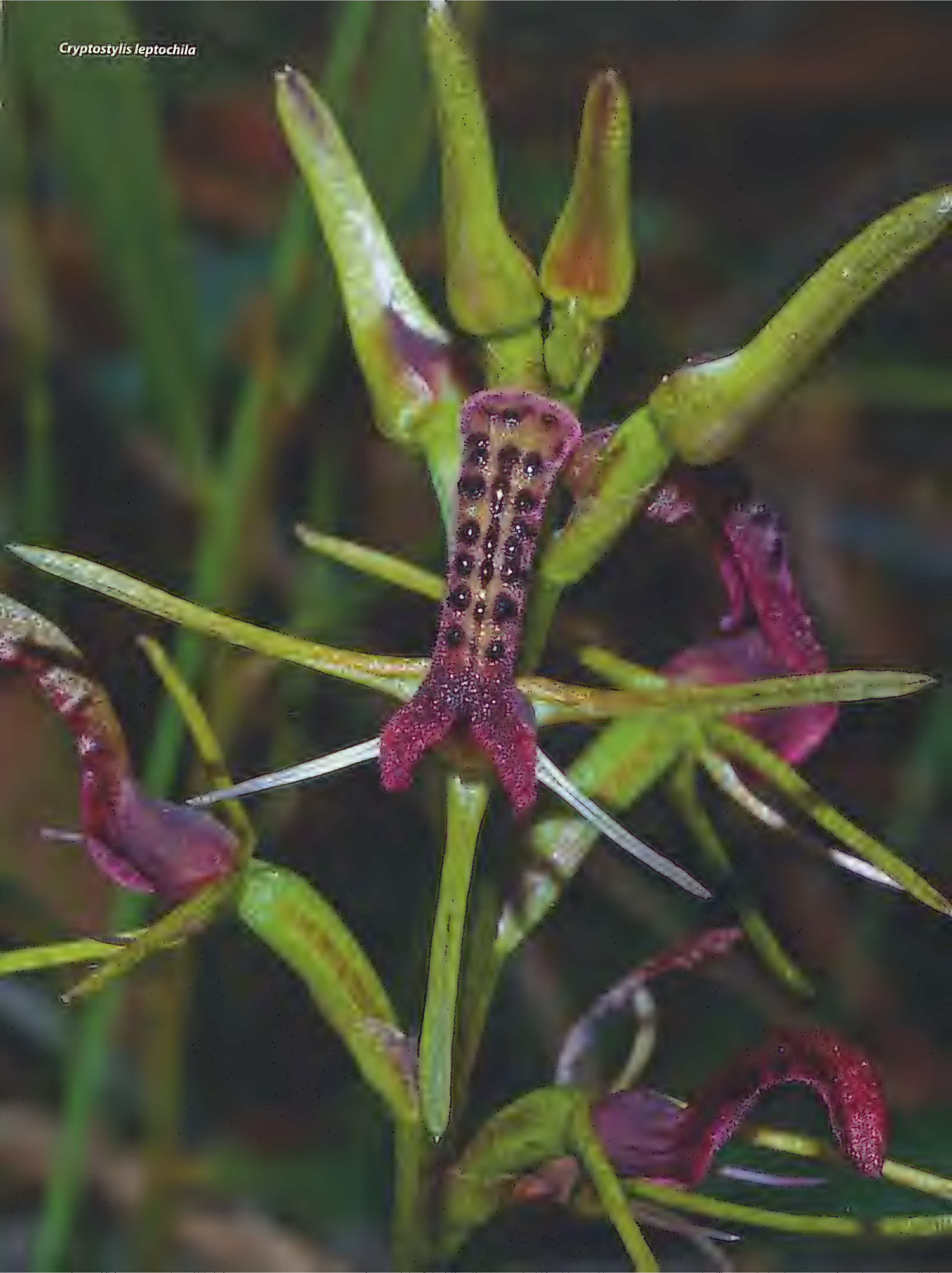
Arachnorchis viriosa labellum front showing white base to calli (photo: Andrew Primer)



Arachnorchis viriosa side showing long comb fringe of labellum (photo: Andrew Primer)



Arachnorchis viriosa Spring Gully (photo: Barb Bayley)



Cryptostylis leptochila

The Capital of *Cryptostylis*

Text and photos by Alan W. Stephenson

Many readers will be aware of my conservation activities and in the course of this I visited a particular area at Vincentia NSW where several endangered orchid species are present. On this site are three threatened species and another just 500 metres away across the road.

Two years ago I accompanied an Environmental Engineer from the Shoalhaven City Council (SCC) to show him what I considered to be a drainage problem arising from developments on the site. I along with an OEH Officer visit the site each year in the course of annual monitoring of *Prasophyllum affine* and in more recent years a population of the beard orchid *Calochilus pulchellus* but *Cryptostylis hunteriana* is also present and two years ago a new species of *Banksia* was discovered. *Cryptostylis hunteriana* is not subject to monitoring and there are also numerous non-endangered terrestrials on the site.

At the end of November I visited the site to check the progress of *Calochilus pulchellus* as seed capsules from one or more plants were to be collected for the cryogenic seed program conducted by The Australian Botanic Gardens at Mt Annan, near Campbelltown NSW.

After checking the readiness of the *Calochilus* capsules I walked across the services easement to the area where the drainage problem occurred and found the SCC engineer had done as promised and redesigned the water flow situation. I knew the area contained other species of *Cryptostylis* and mainly *Cryptostylis subulata* but because this is a species common to this general area had ever undertaken a serious look and I later chided myself for this lack of attention as the number and density of this common species amazed me.

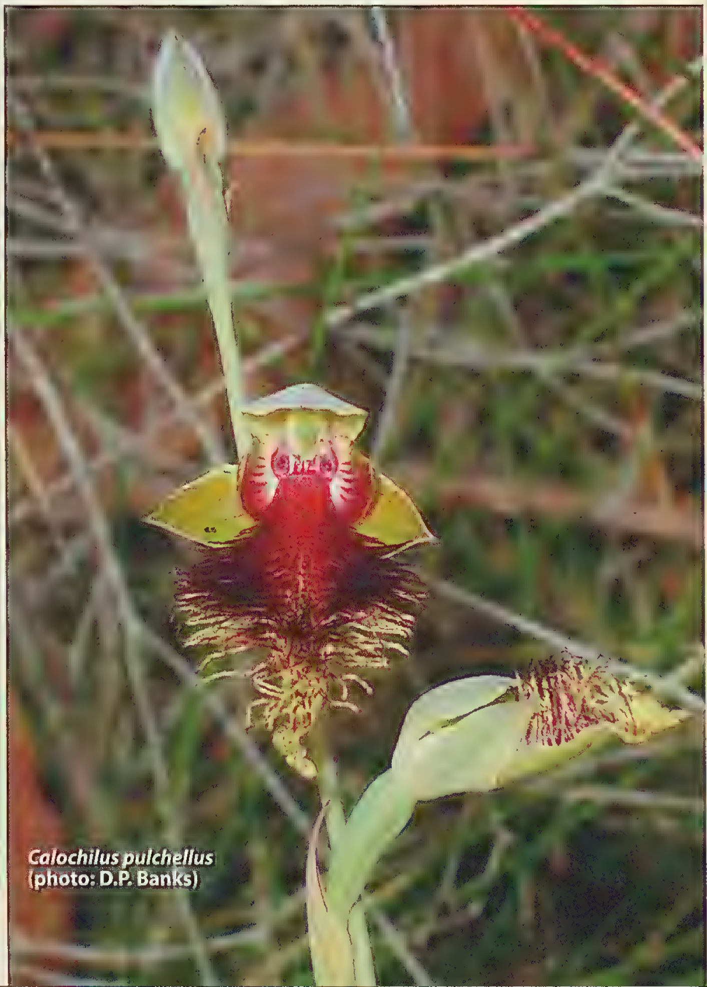
Plants were in groups of up to six but there were many in flower and in bud. One group spread over a 5m x 6m area were 27 plants in all stages. I did not count all plants I saw or undertake a detailed survey but a quick estimate would get to three figures very quickly. I did measure a few plants and most were in the 60cm to 80cm range which to me is about average considering 115cm is the tallest I have encountered but some people (including me) have other ways to spend their time than measuring plants.

The total number of orchid species on the site amounts to 27 but as always I feel there will be a few more lurking somewhere.

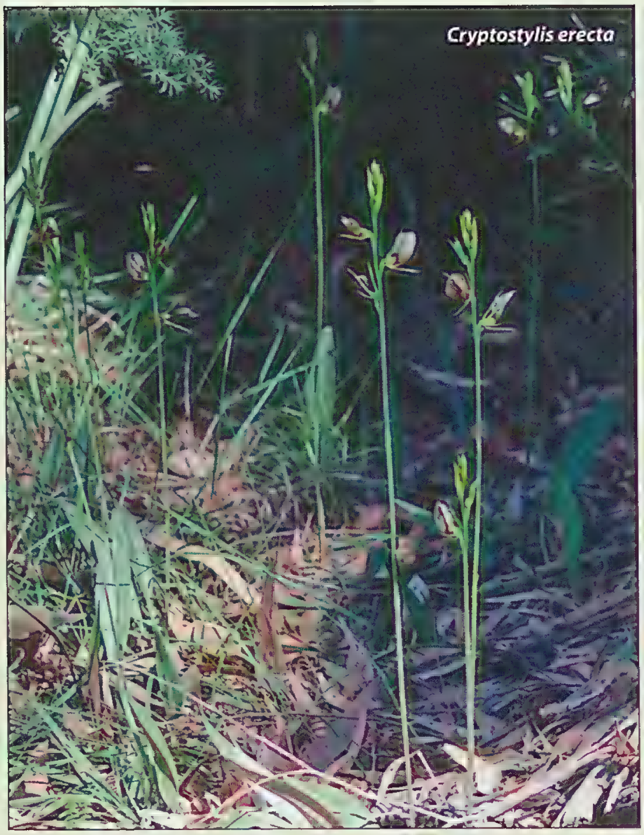
Only one seed capsule was collected on December 11th by the temporary seed collections officer but I was asked to collect a second a few days later as the existing capsules were expected to require another few days.

Meanwhile on another site less than 2km away by road is a population of *Cryptostylis hunteriana* which I use as an annual reference base for flowering of this vulnerable species and one which has proven difficult for many people when an environmental assessment is required. Firstly it is a leafless terrestrial, secondly it has a very irregular flowering habit in that it is well known to flower on a site and not be seen on that site for several years, a fact I have noted in my general wanderings over many years. Dr. Mark Clements in his studies of this species as it related to the road bypass of Bulahdelah NSW found many irregularities with this species which is too detailed to go into for this article but suffice to say, some plants were classed as annuals, whereby they should be perennials with a regular flowering habit.

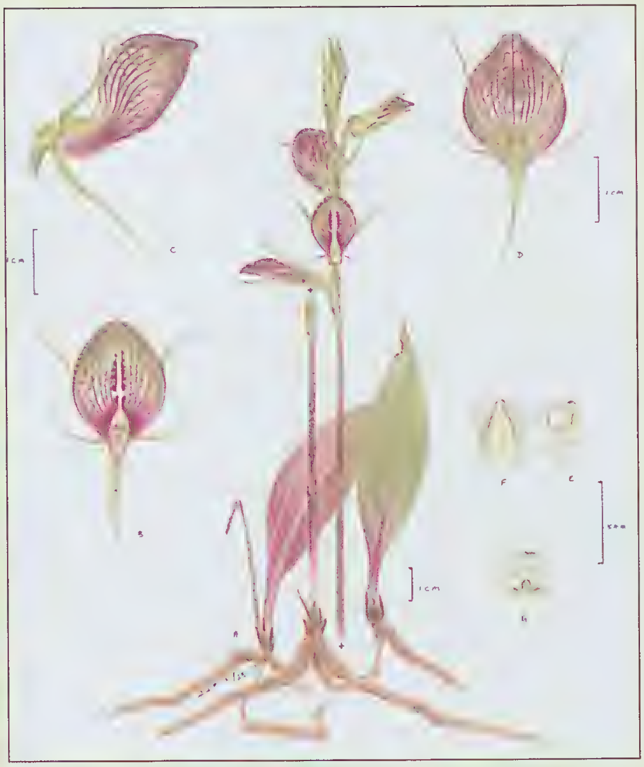
The site I use is now secure from a threatening development and easily accessed and this particular small section is usually host to about 20 good plants but this year the count was 15 but these were in the main, simply the runts of the litter. Not only were overall numbers down but flower numbers per plant were less and these were small in size compared to 2014 flowers. I put this down to a lack of rain over October and November 2015. For each of these two months the rainfall was 33% of the 23 year average and so far for December 2015, I have measured 0.25mm in the first 11 days, I should not be surprised to find plants smaller than average.



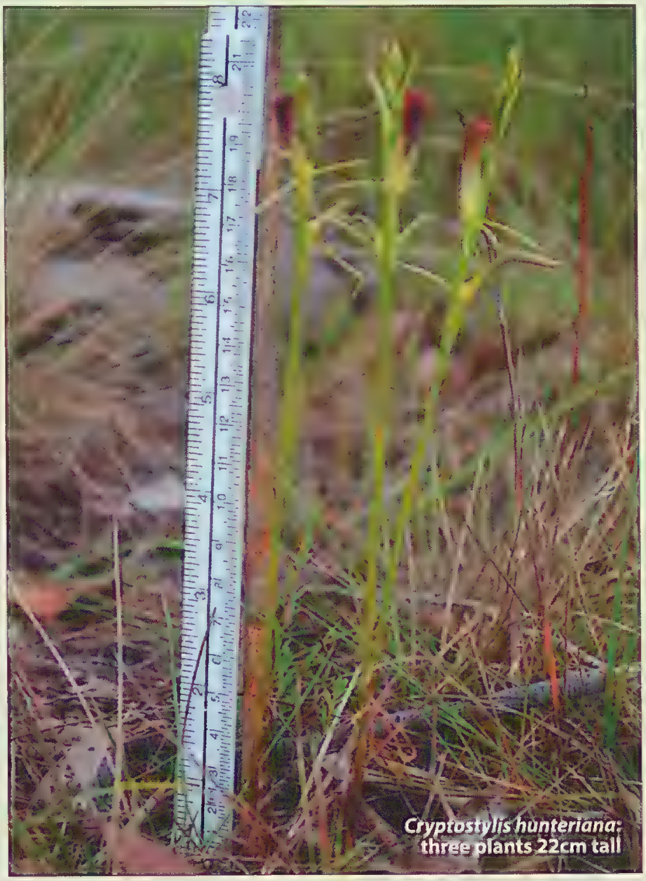
Calochilus pulchellus
(photo: D.P. Banks)



Cryptostylis erecta

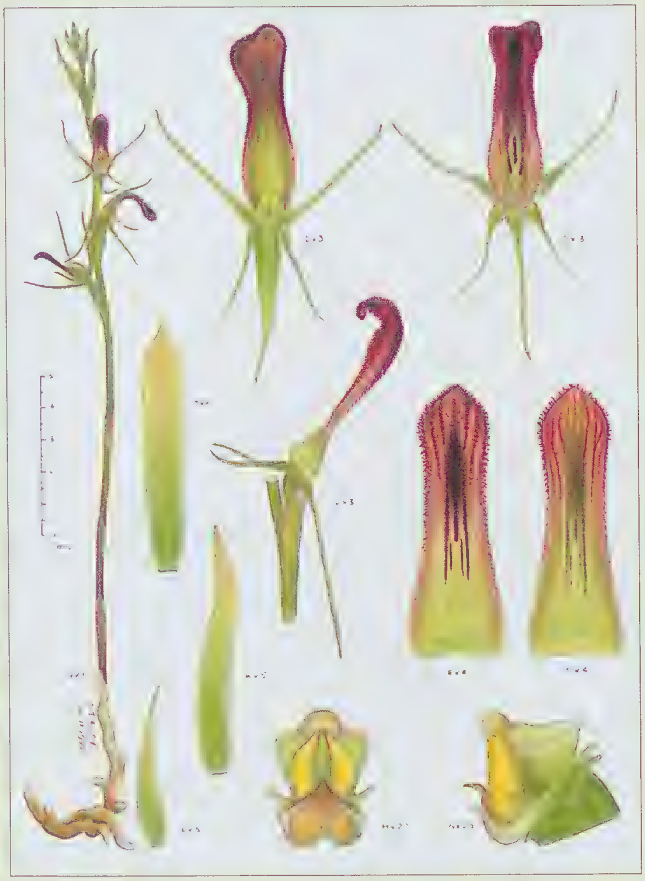


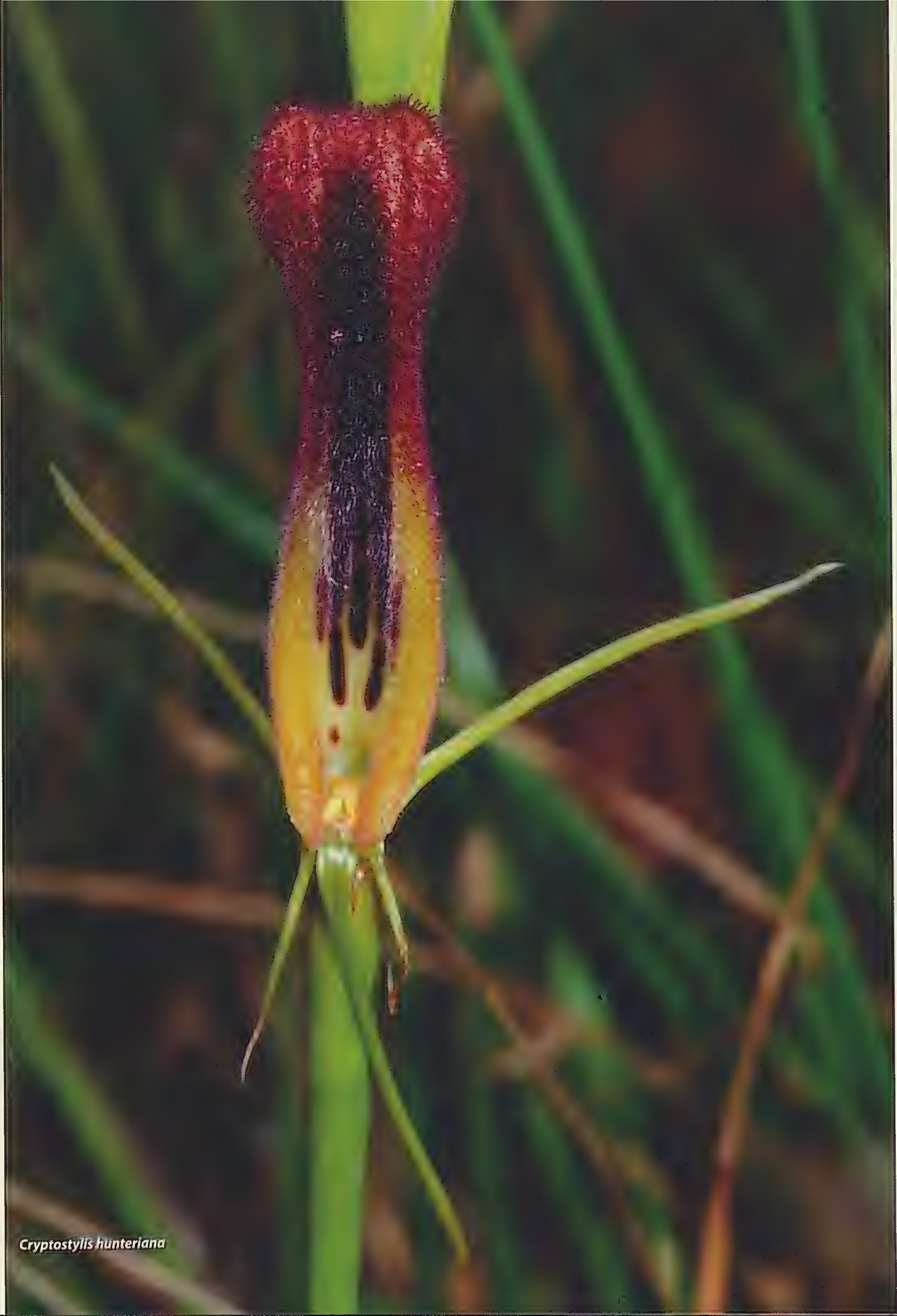
Cryptostylis erecta (drawing © J.J. Riley)



Cryptostylis hunteriana: three plants 22cm tall

Cryptostylis hunteriana (drawing © J.J. Riley)





Cryptostylis hunteriana

One difficulty with recognising this species, apart from it being leafless is its habit of producing usually one open flower at one time. As the labellum is the main feature and most colourful segment, if the plant is approached from the side where the labellum is not completely visible it is possible to overlook a plant and early in my experiences with this species that did occur. This was significant as the plant I almost overlooked was the first ever recorded at altitude (650metres). This taught me a good lesson to always look on the other side of the tree or rock or walk on the other side of the track when returning to the start point.

To reinforce the difficulty with *Cryptostylis hunteriana* and its irregular flowering habit, the plant at altitude was first seen in 1999 and has not presented since then but as it is not far away I have checked the site each year since but who said chasing orchids could be a frustrating pastime.

A final point regarding this genus is that all four species known to occur in the eastern states of Australia can be found on one 6km track through a local national park. This begins at the northern end at 280m and drops gradually over the 6km to 200m. This location is not the focus of the article but a reminder of the variability of orchids and another point which reminded me about this is that many years ago I was of the opinion this was a species which occurred only at altitude *Cryptostylis leptochila* is also *in situ* across the road from a local NPWS Depot at 65m and is why what we learn about orchids is how much we don't know.

Thank you to John Riley for the use of three of his original *Cryptostylis* drawings and to David Banks for his image of *Calochilus pulchellus.*

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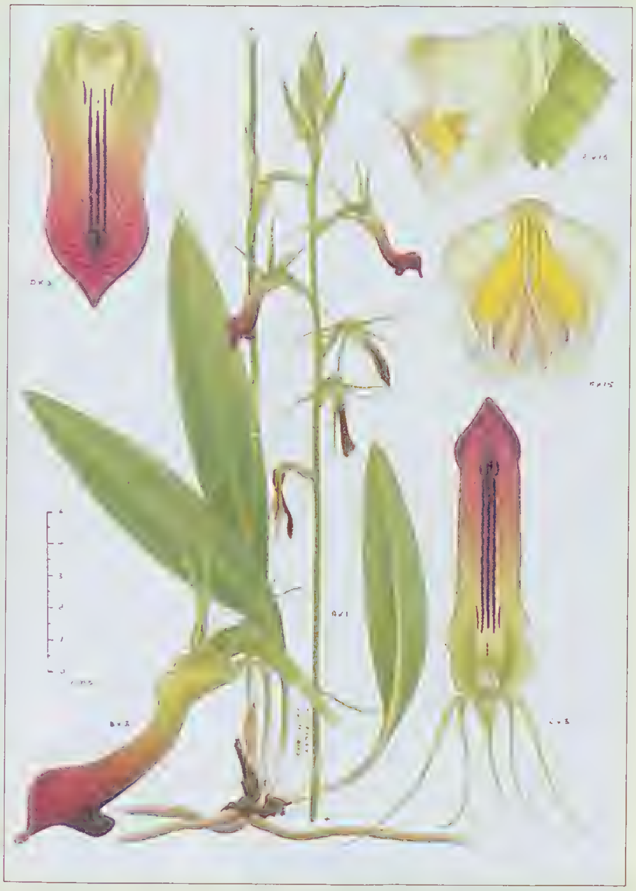

Cryptostylis subulata (drawing © J.J. Riley)

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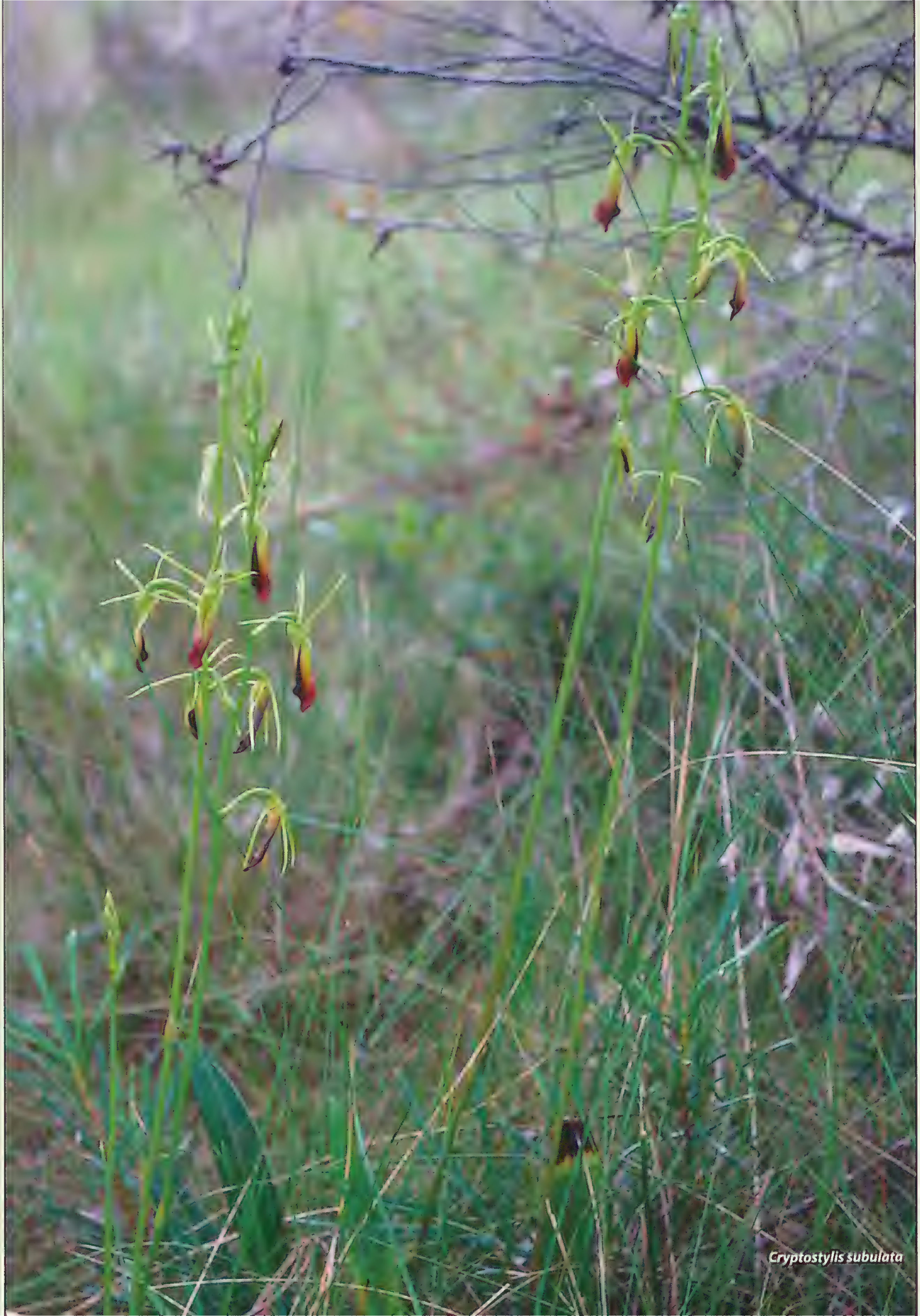

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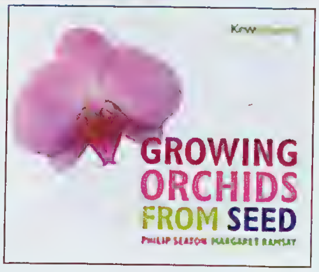

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by Mark A. Clements

From 1788 when First Fleet artist George Raper painted *Diuris punctata*, the botanical world has been fascinated by Australian orchids. Hundreds of orchid images from the National Library of Australia's collection, with words by Mark Clements from the Australian National Herbarium in Canberra, make *The Allure of Orchids* a must-read for lovers of flowers, original paintings and our indigenous orchids. Many of these unique botanical illustrations are being showcased to a wider audience for the very first time.

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The Allure of Orchids is divided into two parts; Terrestrial or ground orchids and Epiphytic or tree dwelling species. Clements says, "These illustrations can be enjoyed simply as works of art and part of our rich and colourful Australian illustrative heritage. But, significantly, they are also part of the scientific record of this country, particularly during the early exploration of the continent."

Interestingly, a lot of the old and traditional Latin botanical names have been used in this work. The author makes a significant number of anecdotal notes and comments throughout the book, to keep the reader fully informed. It is a "must have" book for those interested in Australian orchids and historical botanical art.

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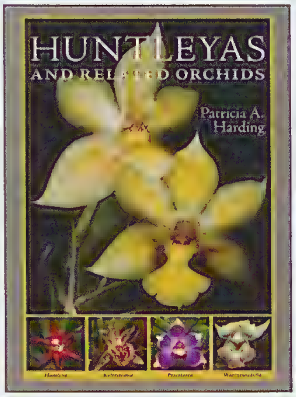

HUNTLEYAS AND RELATED ORCHIDS

by Patricia A. Harding

Revered by avid orchid collectors for its delightful, star-shaped flowers, *Huntleya* is a small group of orchids found low in the forest. *Huntleya* is a small orchid genus that includes fourteen species. They occur in wet cloud forests at medium altitudes of Guatemala, Costa Rica, South America down to Bolivia. The type species *Huntleya meleagris* also occurs in Trinidad. Besides their striking colours — from deep blue to waxy red, royal purple to almost black — flowers of this group are known for their distinctive shapes, patterns, and textures. As appealing as these lovely tropical orchids are, their identification has been confused since the first species was described in the mid-1800s. Recent DNA studies have led to a clearer understanding of relationships and, as a result of this clarity, it is now possible to sort out the taxonomic problems and identify the characteristics that set species apart. In this first book devoted to the *Huntleya* alliance, author Patricia Harding presents evidence from the scientific literature, other growers, and her own experience that will enable orchid enthusiasts everywhere to identify their plants and grow them successfully. Patricia A. Harding is an accredited American Orchid Society judge who has been growing and photographing orchids for three decades.

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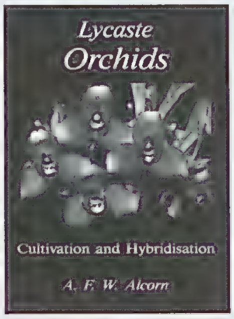

LYCASTE ORCHIDS - Cultivation and Hybridisation

by A.F.W. Alcorn

Lycaste orchids are easy to grow, and they produce flowers that range from the beautiful to the bizarre. No book previously has provided detailed cultural requirements of the Lycaste, and this book should fill that gap, and encourage new growers to take up the cultivation of this beautiful genus. A section on hybridising contains valuable information on inheritance and genetics that will benefit any hybridiser, not just the grower of Lycastes, as well as helpful hints on how to avoid pitfalls in your hybridising program. Michael Hallett, a friend of Fred Alcorn for a number of years, co-wrote this book with Fred and has completed it posthumously. He has a background in genetics, research and botany, and a passion for plants, especially orchids.

237 pages.
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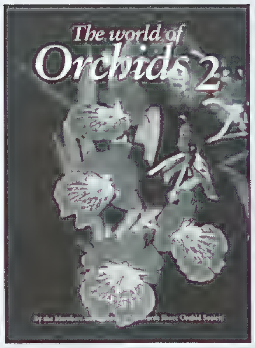

THE WORLD OF ORCHIDS – 2

The World of Orchids – 2 has been written by members and friends of the North Shore Orchid Society about orchids grown in Sydney and its environs, and we are indebted to those people for their time and effort.

It has been produced to cover a large range of genera to help not only the novice, but also the experienced grower in their present fields of interest, and to tempt and encourage them to try other genera.

It should be pointed out that the methods of culture used by the authors are those which they themselves have found successful. Growers should try any changes to their own culture gradually and on a few plants first, as orchids respond differently under different conditions.

80 pages.
Colour and B&W.

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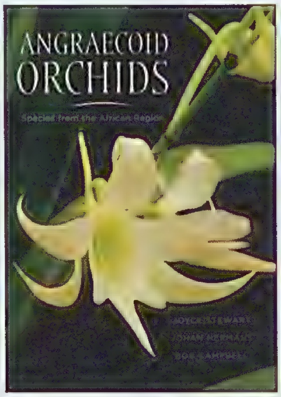

ANGRAECOID ORCHIDS: Species from the African Region

by Joyce Stewart, Johan Hermans, and Bob Campbell

These so-called 'Jewels of Africa' with their sparkling flowers, distinctive growth habit and floriferous nature are much prized and this account, the first to include the Angraecoid orchids of both Africa and Madagascar, is long awaited. It brings together, in a single volume, descriptions of all 690 species in this intriguing group of orchids and will be the essential reference for all Angraecoid orchid enthusiasts for years to come. Including such horticulturally important genera as *Angraecum*, *Aeranthes*, *Aerangis* and *Jumellea*. Stewart, Herman and Campbell have all spent time in various parts of eastern and southern Africa and precise ecological information relating to habitat, altitude preferences and flowering season of individual plants will be particularly helpful to growers. The diagnostic features of each genus are illustrated and over half the species are accompanied by exquisite photographs taken in both wild habitats and in cultivation.

432 pages,
290 colour photos.
185mm x 265mm.
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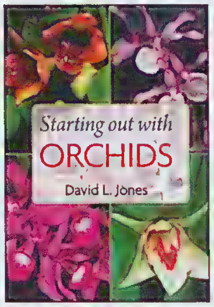

STARTING OUT WITH ORCHIDS

by David L. Jones

David Jones is arguably one of Australia's most prolific, precise and respected botanical and horticultural authors. The book is divided in two parts. Part One begins with the cultivation chapters, covering Easy Orchids for Beginners, General Cultivation Requirements, Growing Epiphytic Orchids, Growing Terrestrial Orchids, Orchid Pests and Diseases, Housing Your Orchids and Propagating Your Orchids. The information contained within these pages alone is required reading for all beginners through to experienced orchid growers. The text is very easy to read and understand with numerous sound cultivation tips and treatments discussed. There are many excellent and clear line illustrations that help describe terms or highlight diagnostic features. There are over 250 colour photographs.

Part Two discusses the orchids themselves with concise information on each species. They are grouped primarily according to climatic requirements, starting with cool growing orchids progressing to the warm growers, in alphabetical sequence first with terrestrial genera, followed by the epiphytes. Both Australian and exotic species are treated together. For each entry there is specific detailed information on each species, as well as a simple table giving the basic cultivation needs and flowering season. A glossary is also included to explain unfamiliar terms.

240 pages, colour.
210mm x 148mm.
Softcover.

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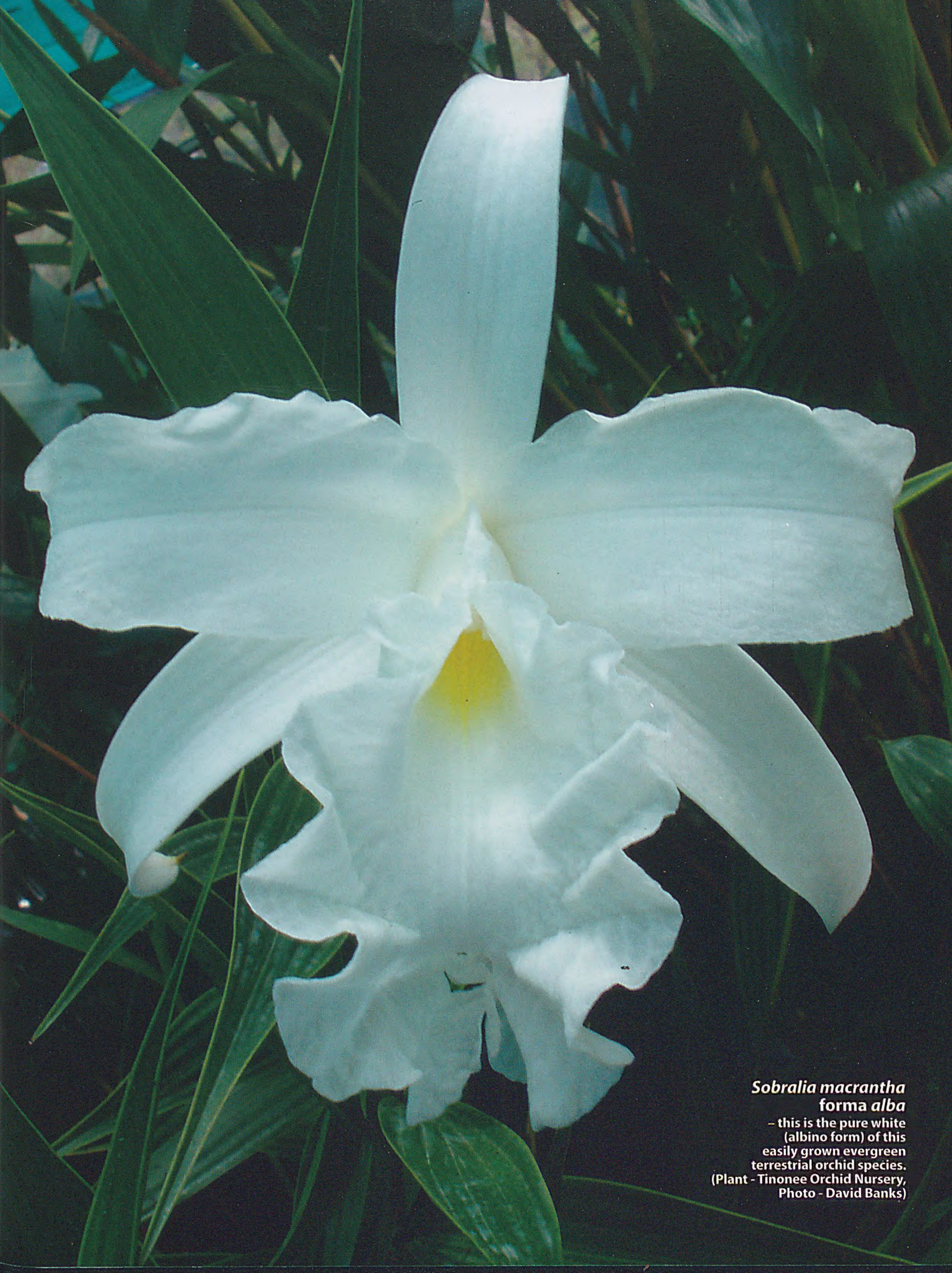

Sobralia macrantha* forma *alba
– this is the pure white (albino form) of this easily grown evergreen terrestrial orchid species. (Plant - Tinonee Orchid Nursery, Photo - David Banks)

2016 ORCHID EVENTS – *What's on!*

February 27 Hills District Orchids
– Autumn Open Day
– Northmead, NSW

March 4-6 Queensland International Orchid Fair
– Beenleigh, QLD

March 12 Bellingen Plant Fair
– NSW

March 19-20 Merimbula Workshop
– NSW

April 9-10 Collector's Plant Fair
– Hawkesbury, NSW

April 15-16 Castle Hill International Orchid Fair
– Sydney, NSW

April 30 Dubbo Orchid Society Workshop
– NSW

May 7-8 Mothers Day Weekend Spectacular
– Port Macquarie, NSW

May 13-15 Orchids Out West
– Hawkesbury, NSW

June 10-12 Diamond Festival of Orchids
– Nambour, QLD

June 25-26 Mingara Orchid Fair & Show
– NSW

July 9-10 Tinonee Orchids Open Day & Show
– Tinonee, NSW

July 31 Hills District Orchids
– Winter Open Day
– Northmead, NSW

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TINONEE ORCHIDS

On the scene in 2016

2016 DIARY

Tinonee Orchids will be at the following shows and Orchid events.

February 27	Hills District Orchids - Autumn Open Day
Mar 4-6	Queensland International Orchid Fair - Beenleigh
March 12	Bellingen Plant Fair
March 19-20	Merimbula Workshop
April 9-10	Collector's Plant Fair - Hawkesbury NSW
April 15-16	Castle Hill International Orchid Fair - Sydney
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June 10-12	Diamond Festival of Orchids - Nambour
June 25-26	Mingara Orchid Fair & Show
July 9-10	**TINONEE ORCHIDS OPEN DAY & SHOW**
July 31	Hills District Orchids - Winter Open Day
August 12-14	National Orchid Extravaganza - Dural
August 19-21	St. Ives Orchid Fair
August 26-28	Melbourne Orchid Spectacular
September 2-4	ANOS Conference - Kempsey
September 24-25	Plant Lovers Fair - Kariong
September 25	Hills District Orchids - Spring Open Day
October 7-9	Southern Orchid Spectacular - Cronulla
November 5-6	Tweed Orchid Fair
December 4	Hills District Orchids - Summer Open Day

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